Telephone Engineer

WITH WHICH IS CONSOLIDATED THE WESTERN TELEPHONE JOURNAL
ESTABLISHED 1902

VOL. XIV CHICAGO, SEPTEMBER, 1915 NO. 3

"In Compliance With Your Suggestions"

BECAUSE we are all prone to forget our Eastland cases and our Frank cases and our merger cases as time changes the scene and keeps us occupied with new interests, President Fisher of the I. T. A. A. presents us with a gentle reminder, a "memory jogger," in this issue. It is not because we think we can add anything to Mr. Fisher's argument, but because we feel that the subject needs all the forcible treatment it can get, that we offer this comment.

The impression seems to prevail, even among independents, that the oft-quoted Kingsbury letter of December 19, 1913, was a spontaneous and voluntary offering. It has been regarded as coming from a clear sky, surprising the attorney-general as much as it evidently did the President of the United States.

Read that letter again! You will observe that the very first sentence reads: "Wishing to put their affairs beyond fair criticism, and *in compliance with your suggestions,* formulated as a result of a number of interviews between us——."

Obviously the proposal of the American Telephone and Telegraph Company to the United States Government was to all intents and purposes, *directed by the attorney-general,* Mr. McReynolds. The letter was written at his request, and made public only after its contents had been approved by him. How much drafting and redrafting of the agreement was necessary; how many forms, if any, were rejected by his office before a satisfactory one was offered, we cannot say. It is sufficient to know that the famous A. T. & T. letter was not the spontaneous outburst of an altruistic soul seeking equity for all, but a promise inspired by the pressure of the law. In brief Attorney-General McReynolds, and not Mr. Kingsbury, was responsible for the terms of the proposal of December 19, 1913.

That Mr. McReynolds was fully competent to dictate the terms of such an agreement we cannot doubt. Prior to becoming attorney-general of the United States, he had been in full charge of the government's important cases under the Sherman Act, and was the foremost counsel in the country on the subject of the Sherman law. With this experience, and that he enjoyed as attorney-general, there can be no question that he knew what he was about. And for these qualifications he has been advanced by the President to the Supreme Court bench of the United States.

This is important evidence that the so-called Kingsbury letter will legally hold water. It is not a big corporation's clever subterfuge, intended to pull the wool over the eyes of government officials. It is not an ingeniously spurious promise made for the deception of the Independents. It is a legal agreement, supervised by an anti-trust expert, and really intended to mean what it says.

J. C. McReynolds is no longer attorney-general of the United States. The present incumbent is Thomas W. Gregory. But, of course, logically, the change in personnel should mean nothing so far as the treatment of facts is concerned. If Mr. McReynolds approved the agreement it will hold good legally with Mr. Gregory.

There is nothing the matter with the Kingsbury letter. The agreement is there; the difficulty lies in observing it. To see that it is observed, "to the letter," is unavoidable duty of the independents.

Reasonable Return on Investment

ANY man may put his savings into real estate mortgages or the like with the assurance that his money is perfectly safe, his six per cent return sure, and his personal attention not needed. The mortgage does no work, so it cannot operate at a loss. The industrial concern may operate either at loss or profit; to compensate for which uncertainty it often returns its investors from fifteen to a hundred per cent on their money. The public utility may and often is compelled to operate at a loss; but it is not allowed to operate at a profit exceeding a certain modest figure. This profit or return on the money invested frequently is limited to the same figure as the interest on a mortgage.

Returns on public utility investments are frequently limited by law. Rate regulating bodies decree that the investor shall receive only so much interest on his money. He may receive less than the standard figure, but never more.

The attempt to limit the return or the value of securities demonstrates its own fallacy automatically. Limit arbitrarily to 6 per cent the return on a security logically deserving of 8 per cent, and you force the value of the security from 100 down to 75. The figures, of course, are hypothetical, and illustrate a tendency rather than a mathematical process; but the principle is true.

The security buying public is the true and sole judge of the value of an established security. The regulatory authority makes the mistake of assuming that the price of a security is constant, and the rate of return inconstant; so that by fixing or making constant the return,

it can solidify the whole financial arrangement. The truth is that both factors, the price and the return, are inconstant and interdependent. Fix one and the other changes to meet it. Fix both and the securities will not sell, unless the figure fixed agrees with the buying public's experience of that kind of security.

Six per cent is obviously not enough for any public utility's return on investment. It is hard to admit that eight per cent is sufficient to coax new capital in sufficient quantities, when we find that dividends on the capital stock of national banks average around eleven per cent per annum.

We hope to be able to demonstrate in a future article, and prove our conclusions, just why present returns on public utility stocks, and especially telephone stocks, are in most cases inadequate. We hope also to show beyond all argument just what the proper return should be in order to maintain the necessary fiscal balance.

The Remuneration of Engineers

ENGINEERS in general are underpaid. We do not expect that statement to startle anybody in the telephone business, for telephone engineers especially are underpaid. We mean, of course, the engineering employes; the chief engineers and their assistants of the moderate-sized, fairly prosperous operating companies. We might go farther and include the manufacturing companies also; though we presume the statement has already caused employers of engineers to regard us with suspicion, as hinting at a crusade for higher pay and shorter hours. But we don't believe the trouble is with the employers at all.

We reproduce here an editorial from the *Journal of Electricity, Power and Gas,* more because it is interesting than because it helps solve the problem:

> The apparent surplus of engineers is largely due to their inability to find or develop a market for their services. Since hostile legislation and small return on invested capital has withheld money from many projects of an engineering nature, many a good engineer has had to live on past earnings or take up other lines of work. This is unfortunate, for the world is in need of engineering knowledge and training in many lines of endeavor. But until the world knows what the engineer can do, most of his ability, knowledge or training goes for naught.
>
> The problem is essentially one of finding a group of men who will appreciate and value his work and possess the means for paying him. The more men who know that he possesses the qualities which can be of service to them the larger his market. This acquaintance or knowledge depends upon reputation.
>
> Reputation, in turn, is largely a matter of salesmanship, getting others to believe that he has something that they want. This ability is what distinguishes a successful engineer from many of his unsuccessful brethren. Reputation is not inherent in a man, but is what people say about him and to whom they say it. Others may be better engineers, but the world recognizes only the man whom they know by reputation.
>
> One of the best ways for a man to gain a reputation is by writing for publication in those magazines which are read by possible employers. A study of the back files of the engineering periodicals will demonstrate that the prominent engineers of today are those who were contributing to the technical press fifteen or twenty years ago. The same opportunity exists today.
>
> Engineers can also gain reputation by taking an interest in civic affairs. The next ten years should witness a great advancement in the efficiency of municipal undertakings and it will be the engineer's own fault if he is not coupled up with this movement. Enough has been said to suggest that reputation rests upon confidence, and confidence is publicity. The value of these suggestions resides only in their immediate personal application.

Personal publicity helps a great deal. The successful engineers—the few whose remuneration is really ample—never hesitate to see that items about themselves and articles by themselves get into the trade papers. And the trade papers are delighted to get the stuff—make no mistake about that.

We believe a practically unknown engineer, if he has the goods, can "arrive" quicker by the trade paper route than by any other means whatsoever. We believe also that every man intelligent enough to hold down an engineering job can write for publication—at least with the editor's help. Writing acceptable fiction may take talent; but as to writing good technical stuff, we have yet to find the engineer who couldn't.

We are interested in the problem just now because it has been brought confidentially to our attention that certain telephone engineers and salesmen, whose names you might recognize if we mentioned them, receive about the same *per diem* remuneration as a member of a building trades mechanics' union. If there is any remedy for the condition, we have not had time to figure it out—even if we had the ability, which is doubtful. But it is a subject on which we desire more information. What we get we will hold strictly confidential. If your own case suggests any way for betterment, do not hesitate to tell us about it.

When Bell Buys Independent

EVERY case where an Independent operating company is absorbed by any Bell company is a case demanding investigation and the searchlight of publicity. So every such case should have its own treatment on this page. But the Bell companies seem to have grown so extraordinarily industrious in the acquisition of Independent properties, since they promised not to do any more of it, that the record becomes too voluminous for extended individual dissertation.

There may be situations where it is legally, if not morally, proper for Bell to buy Independent. It is up to the United States Department of Justice to say where these cases are. But it does not need a lawyer to point out that the Bell companies cannot legally acquire any Independent plant whatsoever, unless they already controlled the property prior to December 19, 1913—in which case it is *not* Independent at all.

There is a chance for a technical quibble in every agreement. The chance in the Bell-United States agreement lies in the interpretation of the term "competition." Ostensibly the proposal protects all competitors from interference. It so read in the eyes of Attorney-General McReynolds. But if the Bell company is allowed to retire from a certain territory, and then later to purchase the Independent in that territory because no competition exists at the date of purchase, an unfair advantage is being taken of the English language.

It is, or was, plainly the intent of the Department of Justice to stop all mergers and combinations of competing telephone companies. To be competitors, two companies need not necessarily serve the same subscribers. Where state-wide Bell service is withdrawn temporarily from one county for the deliberate purpose of creating an Independent monopoly in that county, to the end that the subsequent merger may have no competitive features, that merger is still illegal. It

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Entered at Chicago Post Office as Second Class Mail Matter

Telephone Engineer

WITH WHICH IS CONSOLIDATED
The Western Telephone Journal
ESTABLISHED 1902

PUBLISHED MONTHLY BY
ELECTRICITY MAGAZINE CORPORATION
MONADNOCK BUILDING, CHICAGO, ILL.
Telephone: Harrison 3014—All Departments

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would be hard to deny that the withdrawal of service was a part of the merger process, and so in itself an act destructive of competition.

Subterfuges for the technical avoidance of definite legal clauses are common enough in all lines of human effort. We are all familiar with criminal cases which were discharged because of technical flaws in the indictments; perhaps a misplaced comma, or the omission of proper designation of the weapon used or of its effects. So long as our laws must be recorded in structures of words, so long as there is gain to be had by confusing the interpretation of those structures, human ingenuity will be directed to that task. The lawmakers use the words at their command to the best of their ability. It is for the courts to say definitely what the words mean—not what one faction or another would wish them to mean.

There should be no argument as to the legal status of Bell-Independent mergers. The meaning of the agreement seems clear enough. But if there be argument, the courts must decide it. And the sooner those charged with breaking the law are proven innocent or guilty, the better for the future of Independent telephony.

The Scope of the "Bell System"

FOR long years the "Bell System," as described by its representatives, has included all Independent companies which have physical connection with Bell lines. At first thought the claim seems rather arrogant, but taking it as meaning that the Bell System *reaches* so many telephones, it is all right. Also, it is all right for an Independent company with Bell connections to say, "The Home Telephone System reaches 8,729,592 telephones."

We have no dispute with the telephone operator who announces to the public the total number of telephones with which his lines connect. Rather we think he is overlooking good advertising if he does not do so. No one person has any use for eight million telephone connections; but when in that eight million is included every telephone he could possibly wish to reach, the scope of the system is a valuable asset.

With universal physical connection all operating companies would have the privilege of advertising the tremendous total of telephones in this country. Then the big figure would soon become still larger; for nothing succeeds like success, and business begets business.

There seems to be little hope of a truly co-operative compact between the Bell and the Independents. Whatever general interchange of facilities is provided must apparently be compulsory. But that inter-connection is coming as a provision of law is inevitable. The only way it can fail is by the negligence of the Independent operators in demanding it.

Those Independent companies which already have Bell connections are not taking full advantage of their opportunities if they do not advertise the fact. And by that we do not mean advertising their competitors, but using the great system of inter-connected Bell and Independent lines just as the Bell companies use it. In short, if you can connect with eight million telephones publish the fact.

But if you are Independent and have Bell toll connections, don't hang your competitor's sign over your door. We have seen even that done.

Program of Panama-Pacific Convention

The following is a program of the technical sessions of the American Institute of Electrical Engineers' Panama-Pacific convention.

Reprints of all convention papers will be available without charge at registration headquarters:

FRIDAY, SEPTEMBER 17, 10:00 A. M.

Telephony and Telegraphy Session.

Submarine Cable Rapid Telegraphy: Ocean and Intercolonial Telephony, by Bela Gati.

Automatic Switchboard Telephone System of Los Angeles, Cal., by W. Lee Campbell.

Continuation of Discussion on Inductive Interference. Introduced by Joint Committee on Inductive Interference.

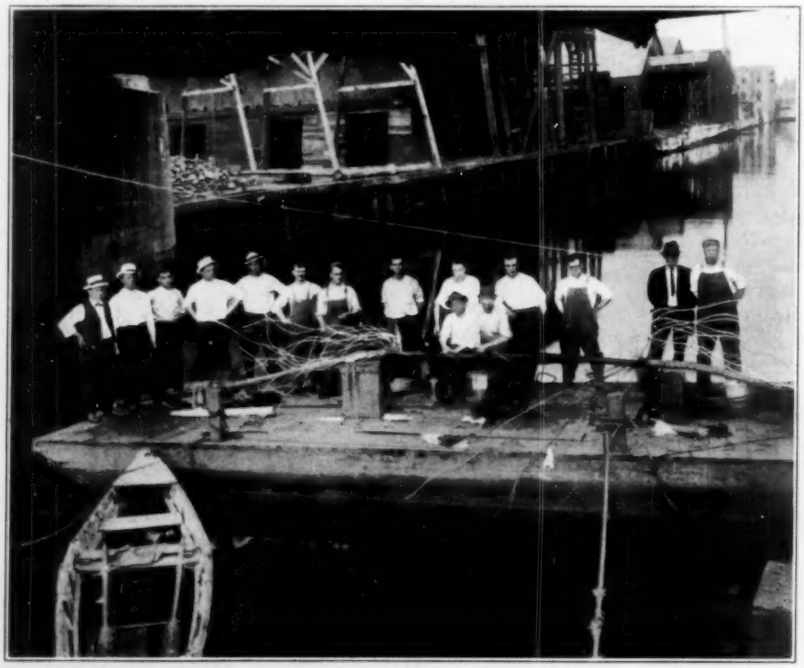
The fifth annual meeting of the Telephone Pioneers of America will be held in San Francisco Tuesday, September 21, Wednesday, September 22, and Thursday, September 23, during the Panama-Pacific Exposition.

The following were appointed on the committee of arrangements with authority to appoint the necessary sub-committees: George E. McFarland, president the Pacific Telephone and Telegraph Company, San Francisco; A. S. Hibbard, American Telephone and Telegraph Company, Chicago, and Gerard Swope, vice-president and general manager, Western Electric Company, New York City.

Arrangements are being made for a Pioneer special train between New York, Boston and other Eastern cities.

From the Forests of the North, Where Pine and Cedar Trees Grow to Great Heights, Lumber Companies Cut Practically the Entire Supply of Telephone Poles Used in Supporting Approximately Eleven and One-half Million Miles of Telephone Lines in the United States. Bound Together in Large Rafts, the Logs, After Being Stripped and Trimmed, are Floated to Saw Mill Reserve Ponds, Awaiting Shipment.—Sand Point Cedar & Lumber Company.

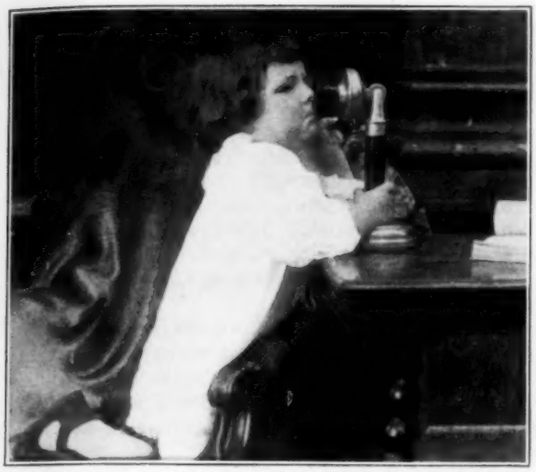
W. O. Anderson of the A-A Produce Company of Topeka, Kans., is a Thirty-third Degree Baseball Fan, and These Days When the Topeka Team of the Western Association is Fighting for the Lead in the Pennant Race "Billy" Seldom Misses a Game. Now, in the Produce Business There Are Many Important Matters That Cannot Wait. Immediate, Fragile, Perishable, Are the Labels on Fruit Shipments. So Mr. Anderson Sits in His Box at the Ball Park and Buys a Carload of Apples From Van Buren, Ark., Between Innings. It's Easy. He Uses the Long Distance Telephone. The Topeka State Journal Declares That Mr. Anderson Transacts Business of This Kind by Long Distance Telephone Every Afternoon the Topeka Team Is Playing at the Park, and It Adds: "He Deserves a Carnegie Medal for Mixing Business and Pleasure Without Making a Botch of Both." Although in This Particular Instance the Telephone as a Medium of Transacting Business is Somewhat Unusual, Nevertheless, It Evidences to What Extreme Duties the Telephone May Be Utilized. The Average Business Man, in this Era of Telephonic Adoption, Appreciates the Value of Communication With His Business at all Times, Under Any Conditions, if Not by Regular Installation, at Least by Special Arrangement. The Fact that Such Communication Can Be Established Not Only Affords the Busy Merchant an Opportunity for Pleasure, but Insures to His Employees a Confidence in Any Case of Emergency Which May Arise.—Southwestern Telephone News.



Repairing a Submarine Cable at Port Huron, Michigan. The Cable Was Severed by the Anchor of a Large Coal Barge Which, in Backing Out of the Harbor, Permitted Its Anchor to Drag in Order to Keep the Barge Balanced. The Cable Was Broken at 8 O'clock, and the Telephone Company's Crew Began Making Repairs Immediately. After Working All Night, at 4 O'clock in the Morning the Cable Was Ready for Splicing, and at Noon on the Second Day Repairs Were Finished. Twenty-four Feet of Lead Armored Cable Was Substituted for the Injured Part Removed.

A Novel Use of the Giant Sahuaro Cactus. This Telephone Line Connects Tucson With Its Summer Resort; Mount Lemmon, in the Santa Catalina Mountains.—Mountain States Monitor.

STORIES IN PICTURES OF TELEPHONE PRACTICE AND PROGRESS IN ALL PARTS OF THE WORLD.



In Producing Moving Pictures, the Telephone is a Frequent Feature. It Assists in Furnishing Speed in Communication and Connects Scenes and Action Which Could Not Be Duplicated Satisfactorily by Letter or Messenger. Especially Where Children are Featured, the Acknowledged Simplicity of the Telephone Furnishes Satisfactory Results and Avoids Excess Training in Acting.

On July 2 Frank Holt, a Demented Student Who Later Killed Himself, Placed a Bomb in the Senate Reception Room of the White House. The Wreckage on the Floor Was Formerly a Switchboard.—The Transmitter.

When the Frisco Railway Built Its New Freight House at St. Louis as Close to the Curb as Possible It Discovered That the Telephone Company's Poles Inside of the Curb Would Interfere With the Wagons. Holes of Sufficient Size Were Cut Through the Roof and a New Line of Poles Set Up.—Southwestern Telephone News.

Poles Which Have Been "Driven" or "Floated" to the Mouth of the Cedar River Ready for Rafting Booms The Huge Logs are Floated in Reserve Mill Ponds Until They are Thoroughly Water-Soaked. The Seasoned Poles are Then Dryed and Shipped to Various Sections of the Country to Support Telephone Lines.

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Guy Green
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Ind USA

NOTHING is to be written on this side except the date and signature of the sender. Sentences not required may be erased. If anything else is added the post card will be destroyed.

I am quite well.

I ~~have been admitted into hospital~~
{ ~~sick~~ } ~~and am going on well.~~
{ ~~wounded~~ } ~~and hope to be discharged soon.~~

I ~~am being sent down to the base.~~

I ~~have received your~~ { ~~letter dated~~ ..... / ~~telegram~~ ..... / ~~parcel~~ ..... }

Letter follows at first opportunity.

I have received no letter from you
{ lately.
{ ~~for a long time.~~

Signature only. G Green

Date 23-6-15

[Postage must be prepaid on any letter or post card addressed to the sender of this card.]

(15560) Wt. W3487-293 1,130m. 6/15 M.R.Co., Ltd.

Showing Both Sides of a "War Postcard." This Card Was Received from the Front by an Employee of the Central Union Telephone Company at Indianapolis, Ind., and Was Written by the Recipient's Brother, a Former Bell Telephone Employe. As Will Be Seen at a Glance, There is Little Opportunity to Communicate Anything on This "Standard Form."—Courtesy Bell Telephone News.

STORIES IN PICTURES OF TELEPHONE PRACTICE AND PROGRESS IN ALL PARTS OF THE WORLD.

Telephone Essential in Modern Warfare

If the telephone were not a part of the army equipment today the war simply could not be conducted at all along the present lines. The war thus far has been an artillery duel. Without the telephone the big guns would be useless, for the objective is rarely, if ever, in sight of the battery.

The gunners train their guns on the target by laying them at a fixed angle with some definite visible point. The captain goes to a place from which he can see the enemy, and has a telephone line run out to him from his battery. Watching the fall of the shells, he telephones in the necessary corrections in order to direct the gunners properly.

In the German artillery trenches orders and instructions are sent almost exclusively by telephone, the soldier attending it lying face downward and calling out instructions for firing, giving the range and the distance.

The perfection which has been attained in means of communication is a factor of incalculable value in warfare.

For instance, the possibility of such a departure from the front as that of General Sir John French recently would have been unthinkable in other days.

Today, however, General French can return to England, confer with Lord Kitchener and Premier Asquith, attend councils before the king, and in the meantime hold hourly conference over the telephone with Sir Archibald Murray at the front in France or Belgium.

A direct telephone line to the base headquarters at St. Omer, France, from the home of General French, near Hyde Park, London, insured General French being in as close touch with conditions at the front during his three days' visit to England as if he were present at headquarters.

Not the least valuable phase of telephone usefulness, though seemingly a very minor one, is its ability to supply entertainment to the entrenched armies.

A really grave hardship of war is the entire lack of diversion suffered by the men at the front, and the strain of remaining long in the trenches without any amusement has frequently proved extremely serious.

By means of the telephone, however, a way has been opened to overcome this condition, for it has been found that soldiers in the front trenches can listen to gramophone concerts being enjoyed by men in camp eight miles in the rear.

The report does not specify how widely this means of diversion has been employed so far, but limited as its application must of necessity be at present, it is undoubtedly of very definite value.

In obtaining information regarding the movements of the enemy the telephone is of the greatest significance, and the multitude of adaptations and skillful maneuvers to transmit information by telephone unknown to the enemy are practically unlimited.

Examples of these various devices are manifold, but one instance warrants especial mention.

One day during a change in position the Russian troops in hundreds passed by a man in soldier's uniform lying in a ditch, where he complained of rheumatism, but refused aid.

Finally, a Cossack patrol came along, and one of the Cossacks, suspecting that the man might be a spy, struck him with a whip.

At this he leaped to his feet, revealing a telephone, over which he had been telling the Germans of everything that had passed along the road.

Meter Plan Proposed for Detroit

Whether a metered system will benefit Detroit's telephone service by cutting down the number of calls is questionable, but one thing is certain, and that is, if the application of the telephone company is granted by the state commission, the revenue from telephone subscribers will be greatly increased.

A preliminary investigation and a comparison of figures shows that the annual increase in revenue to be derived from metered service, even the so-called modified form, would be about $600,000—a 20 per cent increase.

There are two contentions before the state railroad commission. The people of Detroit want better telephone service, and the telephone company wants more money from its subscribers. They don't want cheap telephone service, but want good service—and at reasonable rates.

It is expected that Detroit will join with Milwaukee and other cities in demanding a federal investigation of the American Telephone & Telegraph Company and of the Western Electric Company, which, it is claimed, exact large sums of money from the telephone companies they are parent to. The city is expected to delve into the financial affairs of the telephone company as deeply as possible. They are not satisfied to take the appraisal submitted by the company without first learning something about the intricate financing of the concern.

The city has requested the privilege of selecting its own appraiser and auditor without interference from the railroad commission.

It was thought that the commission would bear at least a part of the expense of investigation, but it was later learned that such was not the case. In this event the city will employ its own experts and the commission will have to hire other experts if it expects to follow the work of investigation closely. Nothing is being done on the appraisal work, and the city will have to ask for an extension of time in which to complete the work after it is started. The three months allowed by the railroad commission will be up September 3.

Tacoma Loses Franchise Suit

Tacoma, Wash., by decision of the state Supreme Court, lost its case against the Sunset Telephone & Telegraph Company, by which it sought to prevent the company from operating in Tacoma under the franchise of the Home Telephone Company, which it purchased at a court sale. The decision reverses the Pierce county court, which held for the city, entering a judgment of forfeiture of the Home franchise.

The city's argument relative to the destroying of the "automatic" telephone system, which was used by the Home company, but removed by the Sunset company when it took over the plant, is an unsound argument, the court held, adding that the company did not have to operate automatic telephones exclusively. The court interpreted "automatic" as purely descriptive.

Sues Against High Tension Wires

The Nebraska Telephone Company has started an injunction suit in district court to prevent the Central Station Engineering Company from placing high tension power wires near telephone wires at Elkhorn, Waterloo and Valley, alleging that telephone service would be endangered.

Remember the Promise!

It Was Agreed That There Were to Be No More Bell-Independent Mergers

BY HON. E. B. FISHER

IS IT a real kindness to call the attention of very busy men, men who may fairly be said to be overwhelmed with their great and multifarious duties, to what probably must be called lapses of memory? We are bound to assume that men occupying very important, leading relations with some of the greatest businesses of the world, when they make plain, unequivocal promises to the public concerning that business—solemn, written promises if you please—and also plainly state that those promises are made at "suggestions" of the paramount authority of the land concerning such matters, if they fail or neglect, in any degree, to fulfill such promises, must have faulty memory. We cannot for a moment, even by implication, assume any other view of such a matter, under the circumstances narrated. So, is it not kindness to refresh such faulty or overburdened memories by a gentle reminder or hint?

December 19, 1913, a notable letter was sent to the Hon. James C. McReynolds, the attorney general at that time—now a justice of the Supreme Court of the United States—which after the customary salutation started off with this introduction:

Wishing to put their affairs beyond fair criticism, and *in compliance with your suggestions,* formulated as a result of a number of interviews between us during the last 60 days, the American Telephone and Telegraph Company and the other companies in what is known as the Bell system, have determined upon the following course of action:

* * * * *

Second: Neither the American Telephone and Telegraph Company nor any other company in the Bell system will hereafter acquire, directly or indirectly, through purchase of its physical property or of its securities, or otherwise, dominion or control over any other telephone company, owning, controlling or operating any exchange or line which is or may be operated in competition with any exchange or line included in the Bell system, or which constitutes or may constitute a link or portion of any system so operated, or which may be so operated in competition with any exchange or line included in the Bell system.

Pretty complete, concise, and positive, isn't it? The saving clause or exception was limited to transactions then practically completed, but not announced, perhaps, and they were subject to the consideration and approval of the department of justice.

It is not unfair at this point to say that about this time the department of justice was bringing to a successful conclusion an important litigation against the Bell Company in the District Court of the United States for the District of Oregon, tried before Judge R. S. Bean. The decree of the court is dated the 26th day of March, 1914, but it must be remembered that some time had been taken in framing that decree, and it is fair assumption that its terms were well understood and accepted, quietly, before the letter just mentioned and quite possibly had not a little to do with drawing out such concise, positive promise of future good behavior from a corporation that the attorney general evidently had felt constrained to "formulate" suggestions to.

The Bell Company, up to the time of this decree, had determinedly, positively, and invariably affirmed that it did not violate the Sherman Act, so called. But in this decree it was found guilty and was compelled to accept that finding and do works meant for repentance. It was a dictum of a United States Court, accepted, and is the attitude and law of the land, the whole country.

The meat of that decree is in these two paragraphs:

Third: That the defendants, except those dismissed, heretofore entered into a combination to acquire the properties hereinafter specifically ordered to be disposed of, and to commit other acts hereinafter specifically enjoined, and thereby to restrain and monopolize commerce in respect of furnishing facilities for telephonic communication between the states of Oregon and Washington and between the states of Washington and Idaho, and now are parties to said combination, and are and heretofore have been attempting to monopolize said facilities, in violation of the Act of Congress of July 2, 1890, entitled "An Act to Protect Trade and Commerce Against Unlawful Restraints and Monopolies."

Wherefore, said defendants, and each of them, their officers, directors, agents and employees, are hereby perpetually restrained and enjoined from directly or indirectly doing any act or thing whatsoever in furtherance of the combination, and from continuing as parties thereto, and from continuing to monopolize or attempting to monopolize said commerce or any part thereof, *AND FROM FORMING OR JOINING ANY LIKE COMBINATION IN THE FUTURE.*

Now this decree was against the American Telephone and Telegraph Company and various named subsidiaries on the Pacific coast and in the mountain region, and against Theodore V. Vail, N. C. Kingsbury and other individuals, directors and officers of various Bell corporations.

And the general routine of its impending contents may be assumed to have been known to the writer thereof and his colleagues before that epoch-making letter of the A. T. & T. Co. was published to all the country, under date of December 19, 1913.

But some may say this is ancient history, all of it, and known to us all many months ago.

True, and yet does it not now appear as though some who had most to do with it have, in part at least, forgotten most important parts and promises therein contained?

Isn't it kindly to remind them of those promises, to recall the circumstances, the order of the court as to "any like combination in the future," and then fairly to expect fulfillment of such promises in letter and spirit? For those promises were "formulated" because of "suggestions" of the attorney general of the United States.

And that attorney general was so sound, eminent and learned a lawyer the President of the United States made him a justice of the Supreme Court of the United States.

His attitude and theory of the law which resulted in the beginning of our successful completion of the "Oregon case," is a guide post on monition for his successors, and a safe basis for future application, and rule of conduct for all concerned.

So it must be assumed, in reasonable charity of opinion, that there have been defective memories which should be quietly jogged to the end that law as clearly defined, and as clearly accepted, shall be properly enforced.

Purchases of telephone properties in eastern Ohio, in West Virginia, clearly interstate companies, in Sanford, Fla., in Illinois, in Iowa, in southern Michigan, in Indiana, in Kansas, in Missouri, in New Jersey—all through the land, by the Bell Company, should not be permitted if Mr. McReynolds and the court were right—

State Railroad Body Proves Broken Reed in Fight to Curb Telephone Trust

(*Special to The Detroit Times*)

Coldwater, Mich., Aug. 23.—It is estimated that fully one-half the telephones in Branch and St. Joseph counties have been ordered out within the past 30 days.

There were more than 9,000 in service in the two counties, six months ago.

The reason is found in the tactics of the Bell Telephone Company since its absorption less than a year ago of the Southern Michigan Telephone Company. The facts in the case were outlined for *The Times* by a man who has been in the thick of the fight against the "telephone trust."

The Southern Michigan Telephone Company was organized and began business about 1903, and did business in the two counties, competing with the Bell. Less than a year ago they merged with the Bell, and bought up all the Independent lines in the two counties.

The Southern Michigan bought in all 4,719 telephones, including exchanges and trunk lines, and paid for them $291,569, or an average of $61.78 per telephone. The Southern Michigan had of their own system 3,821 telephones, not including the farmers lines, owned at Quincy, by the farmers. When the recent appraisal and application for a raise of rates was made, the combined property of the Southern Michigan Company was claimed to be $1,369,631.44.

This appraisal made the value of the Southern Michigan telephones worth $282.14 each, while those bought of other companies had averaged $61.78 each.

The merger had, however, been effected through the false pretense that the rates were to be continued as before. The application to the railroad commission had to state the rates to be charged under the law. The people were put to sleep under this cocaine, and expected protection from the commission. Within three weeks after the merger had been completed the aplication for raise of rates was made. The people thought first to organize a new company. They found the way blocked. No new company could build a rod of telephone lines along or across a highway without permission from this same railroad commission.

The rates asked for were to result in more than double the former expense for the same service.

Some telephone user out in the county called for a meeting of patrons at the court house in Coldwater. On the day appointed more than 600 citizens met and heard for two hours the attorney of the Southern Michigan Company try to explain the situation. Upon questioning him, the people were unanimously disappointed and dissatisfied.

They appointed a committee consisting of Hon. William H. Lockerby of Quincy, W. H. Cowel of Coldwater, Emory Luce of Gilead and Milo D. Campbell of Coldwater as a committee, to represent them before the railroad commission. That committee has spent weeks in the matter, has attended hearings at Lansing on several occasions and have wasted their efforts without the slightest avail, or possibility of accomplishment.

They have charged nothing for their time or service and have borne their own expenses. The railroad commission's man, C. B. Hall, at first furnished the committee with an elaborately made schedule of more than one hundred towns in the state similar in size to those in Branch and St. Joseph counties, giving number of telephones, names of companies, and the rates charged. The people were told this would be a fair guide for us. The committee compiled the tables at considerable expense of time, and found that the demands of the Southern Michigan Company were extortionate and unreasonable.

When this report was presented, upon the second day of the hearing, the commission there proposed that a valuation be made by some such man as Dean Mortimer Cooley of the University of Michigan. To this the committee readily consented. But this plan was opposed by the telephone company, although to be made at the expense of the state.

The committee then proposed that one or two towns or cities be selected by the commission and an appraisal be made of them to compare with the appraisal made by the company. This also was opposed by the company, and the railroad commission not only backed down from its own proposal for a valuation, but agreed with the company that none should be made if not agreeable to them.

It was then that Commissioner Hemans, as chairman from the bench, announced that there must be an audit of the books of the company, that the state would conduct the same at its expense, since there had been collected from the stockholders of the Southern Michigan company more than $840,000 between 1903 and 1912, and that all the additional income of the property, etc., must be accounted for. It must be known whether the money had gone into the construction of the plant or not.

An adjournment was taken, and after six weeks elapsed the commission announced that the hearing would close on June 25. The committee attended only to learn that the commission had employed the Detroit Trust Company to make the audit; that the auditor had attempted to make the same, but found that there were no books of account, or no vouchers prior to January 1, 1912. For the entire period when the money was received and expended upon the plant these important records were gone. He was told that the janitor had probably destroyed them.

The auditor gave the details of subsequent transactions and the report closed. All the testimony offered with the exception of two witnesses, was of an expert nature and mostly supplied by the Bell people in Detroit and Chicago. Some of the witnesses had been at the Southern Michigan Company's office for weeks, under pay of the Bell Company, and testified that rates should be raised much higher than the demands made. After the report of the auditor, the commission made its decision, granting the Southern Michigan Company all it asked.

As an item worth notice, it should be remembered that there is no one in this neck of the woods who believes the appraisal of the telephone company is of the slightest value, notwithstanding Mr. Hall's fulsome endorsement.

In proof of this we have only to take the only town where they have had an offer to construct a new system to take the place of the Southern Michigan system. This offer was from one of the largest telephone construction companies in the country to rebuild the system in the village of Quincy.

There are about 400 telephones in the system, with switchboard, etc. The company surveyed the town, made maps and blue-prints and agreed to build a system new throughout, with underground conduits instead of overhead, covering the old system complete, and much better, for $9,600. The Southern Michigan Company valued its plant in Quincy at $40,714.81. This will give your readers something of the methods being pursued by the telephone monopoly on its way over the state.

Until the railroad commission shall demand that a company must come before it with clean hands before it falls to its worship, there is little hope of fair play.

How the commission could have rewarded men who sat quietly and allowed the state to employ an auditor to audit books, at state expense, without telling the commission that there were no books to audit, is something of a mystery. Had it occurred in court, it would have been a contempt punishable. But instead of contempt it was unnoticed. Although the law compels books, they are not essential.

Branch and St. Joseph counties were the first battle grounds.

"Detroit and Wayne county will fight in vain," said the *Times'* informant. "They are up against it. The decision is already made as surely as though it were a matter of record. And then on over the rest of the state. Anyone in the room at the several hearings before the railroad commission, could know from the atmosphere, and the surroundings, what was coming."

if the positive promise of the Bell Company in its letter of December 19, 1913, written because of "suggestions" of the department of justice, is to be honestly carried out.

The Independent telephone companies, thousands of them, throughout the land, have a clear moral right—even these frightful times of war demand so much attention of our general government—to recall these facts and courteously, but firmly, ask suitable action. They can and should do it by separate action, each in his own as well as the general behalf, and then by concentrated action. They have a force and power that will compel recognition if they but exercise it.

The Independent Telephone Association of America is moving in this direction, as well as in many others—all intended to be useful—and desires the loyal, generous support of all its present members, and of as many others as are in sympathy with the general sentiments herein expressed, and of such gentle jogging of overworked memories as may be necessary to fully carry out the "suggestions" that—I had nearly said compelled—resulted in the letter and promises of December 19, 1913.

Interstate Commission Valuation Order No. 18

On August 4 a conference of Independent telephone companies was called at the Hotel La Salle, Chicago, to consider Valuation Order No. 18, which had recently been issued by the Interstate Commerce Commission.

At this conference a committee of eleven was selected to consider this matter and take such action as might be necessary. This committee consists of Messrs. S. G. McMeen, Columbus; A. F. Adams, Kansas City; C. Y. McVey, Cleveland; F. B. MacKinnon, Washington, and F. H. Woods, Lincoln, all of the National Independent Telephone Association; Messrs. G. W. Robinson, St. Paul; H. Linton Reber, St. Louis; Edward M. Cooke, Philadelphia; B. G. Hubbell, Buffalo, and E. B. Fisher, Grand Rapids, all of the Independent Telephone Association of America; and William Fortune, Indianapolis, as the neutral member, not being a member of either association.

At that time the committee selected August 14 as the date of its next meeting. At this meeting all of the committee were present excepting Messrs. Hubbell of Buffalo, McMeen of Columbus, and Cooke of Philadelphia. H. Linton Reber was elected chairman of the committee and F. B. MacKinnon, secretary.

After some little discussion a resolution was passed to the effect that all telephone companies should comply as fully as possible with the provisions of the order and that the secretaries of both the National Independent Telephone Association and the Independent Telephone Association of America should write the Class "A" and "B" companies accordingly.

We understand that Valuation Order No. 18 has been issued to some 140 companies, and that this order is but a preliminary step to complete valuation of all of the telephone companies coming under the jurisdiction of the Interstate Commerce Commission. Therefore, this work will be of great importance to the Independent telephone companies. Because of this fact the general committee has selected a sub-committee, which consists of Messrs. S. G. McMeen of Columbus, chairman; H. Linton Reber of St. Louis, A. F. Adams of Kansas City, G. W. Robinson of St. Paul, and Mr. William Fortune of Indianapolis. This sub-committee will make a study of this entire matter and will confer with the Interstate Commerce Commission from time to time as may be found necessary.

Valuation Order No. 18 requires that the carriers furnish information on some seventy different forms which the order contains. The association, in order to assist its member companies and others to comply with its provisions, has had a quantity of these forms printed. These can be procured from the association at $2.50 a set, a set consisting of one sheet of each of the seventy forms. It is suggested that each company should have at least four sets so that they may have two sets on which to make their reports to the commission and two sets for their office file. Companies desiring them should send $2.50 each for as many sets as they require, to the association office, 19 South La Salle street, Chicago, from which office shipment will be promptly made.

Indiana Convention September 15

September 15 and 16 the Indiana Independent Telephone Association will hold the biggest convention in its history. At least that is the indication at present. And a large attendance will not be surprising, either, when one considers the vastly interesting subjects on the program. We reproduce it here on condition that our readers examine it closely; and if they do that they will surely attend. Here's the program:

WEDNESDAY, SEPTEMBER FIFTEENTH.

Morning Session.

10:00 A. M.—Registration, 8th floor, Claypool Hotel.
Meeting Executive Committee, room 740.
Meeting Convention Committee, room 740.
11:00 A. M.—Call to order.
Roll call.
Address of welcome—Hon. Joseph E. Bell, mayor, Indianapolis, Ind.
Response—N. G. Hunter, former president of the association.

Afternoon Session.

2:00 P. M.—Meeting stockholders, the Toll Clearing Company, room 740.
2:30 P. M.—President's annual report, Walter J. Uhl, Logansport.
Reading of minutes of last meeting.
Report of secretary-treasurer.
Appointment of committees.
Resolutions and amendments.
Credentials and membership.
Auditing.
Inspection of exhibits, 8th floor.

Evening.

7:00 P. M.—Banquet .....Claypool Hotel

THURSDAY, SEPTEMBER SIXTEENTH.

Morning Session.

10:00 A. M.—Address, "The Interstate Commerce Commission's Valuation of Telephone Companies".....
.....F. B. MacKinnon
Secretary National Independent Telephone Companies.
Address, "The Value of Association"..W. S. Vivian
Secretary Independent Telephone Association of America.
Address, "Efficiency".....Chas. J. Murphy
Member Public Service Commission.
Address, "Independent Telephony in the Early Days"
.....J. P. Goodrich
Winchester, Indiana.

Afternoon Session.

2:00 P. M.—"The Indiana Workmen's Compensation Law".....
.....Judge Samuel R. Artman
Member of the Industrial Board of Indiana.
"Transmission".....H. D. Currier
Chief Engineer Kellogg Switchboard & Supply Co., Chicago.
General discussion of Independent Telephone Interests in Indiana.
Unfinished business.
Appeals and references.
Report of committees.
New business.
Election of officers.
Adjournment.

Telephone Talks

The September, 1915, Installment of an Instructive Serial Course for all Telephone Workers

BY G. W. CUMMINGS AND ARTHUR KNEISEL*

"THE meeting having been called to order, the President remarked: "At our last meeting somebody said that transmission losses, shunting losses, and self-induction were as clear as mud to him. This is a pretty big subject, but suppose we ask the Tester to tell us something about it."

"Big subject is right," replied the Tester. "I think we had better at least change the order, and say shunting losses, self-induction, and transmission losses, because the third is made up largely of the other two.

"A shunting loss is a very simple matter. We all know that we cannot talk or signal past a dead short-circuit, because all of the current will take a short cut through the short-circuit instead of going out over the line. A shunt is simply a short-circuit, except that instead of being 'dead' it usually has some resistance, and the amount of current which will take the short cut depends on the resistance of the shunt as compared with that of the rest of the circuit. The case is precisely similar to that of a leaky garden hose, where you obviously will not get as much water through the nozzle as you would if the hose were all right. The leakier the hose, the more water will be shunted away and the less you will have available for sprinkling."

"Is there any way we can figure just how the current will divide between the shunt and the rest of the circuit?" inquired the Installer's Helper.

"Easiest thing in the world," was the answer. "At our meeting last May we found that according to Ohm's Law the current in any circuit is equal to the electromotive force divided by the resistance. Suppose, for example, that we have a 110-volt lighting circuit with three carbon lamps, one eighth-candle, one sixteen-candle, and one thirty-two-candle, connected to it. The resistance of these lamps are 440 ohms, 220 ohms, and 110 ohms, respectively. Being connected to the same circuit, each acts as a shunt around the other two, and we want to find out how the current divides between them. Applying Ohm's Law, we find that the current through the eight-candle lamp is $\frac{110}{440}$ or .25 ampere, through the sixteen-candle is $\frac{110}{220}$ or .50 ampere, and through the thirty-two-candle is $\frac{110}{110}$ or 1 ampere. In other words, if one of two parallel paths has half as much resistance as the other, twice as much current will flow through it; or, more broadly, in any shunted circuit the current will divide between the various paths in inverse ratio to their respective resistances.

"I thought you said this was simple," mourned the Cable Splicer's Helper. "You started to talk about shunts and then you switched off onto parallel paths, inverse ratios, and all that sort of thing."

"Cheer up," was the answer. "The four words shunt, parallel, multiple, and bridged mean practically the same thing in this connection and we use whichever one seems to fit best in each case. As to inverse ratio, if you are running to catch a street car and carrying a twenty-five pound load you can make fairly good time, but if your load is fifty pounds you won't run nearly as fast. Your speed will, in fact, be about in inverse ratio to your load."

The Repairman broke in. "You said that we could not talk or signal past a dead short circuit. Some years ago I was working in a local battery office which was being cut over, line by line, to a new common battery office in the same town. When we cut a certain line over it showed permanent, but when we cut it back to the local battery board it worked all right. When I chased it out I found that an interurban street car company had pulled some new feeders tight up under the bare copper wires of my line. Why did it work local battery but not common battery? It looked like a dead short to me."

"How long had your line been up?" inquired the Tester. "You know that bare copper doesn't stay bright very long, and the coating which it collects from exposure to the weather has quite an appreciable resistance."

"It had been up about three years," answered the Repairman, "and now that you speak of it I remember that it was pretty black because it crossed a railroad track in the next span. But I don't see yet what made the difference."

"Since your wire was black, there was evidently considerable resistance in the short, perhaps as much as a couple of hundred ohms," remarked the Tester. "Suppose we say two hundred and see how it works out. Your common battery signal was probably adjusted to operate through at least five hundred ohms and consequently would pull up through this short and put your line out of service. In the local battery office you had a ring-down drop of five hundred ohms, which takes very little current to operate. If we figure simple resistance, when you called up with the hand generator at the set the ringing current would divide between the two paths of two hundred and five hundred ohms in inverse ratio to their resistance, and your drop would get plenty of current to work on. Of course in practice the self induction of the drop would cut down the current through it still further, but would still leave enough current to operate it. So far as transmission is concerned, we didn't have very much cable in those early days, and so we could stand considerable loss without noticing it. Suppose that your loop resistance over the line through the office and back was one hundred ohms. Your talking current would divide between this and your two hundred ohm short in inverse ratio to their respective resistances, two-thirds of it going over the line and only one-third being lost in the short. On short haul open wire connections a loss of one-third would not be serious. This, by the way, is a typical case of a shunting loss, and while under the conditions you have mentioned it did not impair transmission very seriously, under present day conditions, with long cable lengths and

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other difficulties to contend with, a shunting loss of one-third would be entirely too great to be overlooked."

"With a two hundred ohm shunt across a one hundred ohm talking loop you say that we get a transmission loss of one-third. Why don't we get a one-third lighting loss when we bridge a four hundred and forty ohm (eight-candle power) lamp around a two hundred and twenty ohm (sixteen-candle power)?" inquired the Installer's Helper.

"I'm glad you asked that question," answered the Tester, "because I remember that bothered me a good deal some years ago. The difference is simply that the current capacity of a telephone set is limited, and while a local battery set will give out slightly more current under the conditions we have been discussing than it would if the line were clear, it cannot give out nearly enough to compensate for the loss in the shunt, while an electric lighting generator has ample capacity to supply all the lamps which are likely to be switched on at any one time. Of course that raises the question of why the capacity of one is limited more than that of the other, but that's too long a story to go into tonight."

"The location of the shunt makes some difference," remarked the Switchboardman. "If I test for a short in the multiple by putting battery on at one end and then going down the board with a head receiver the click gets weaker as I approach the short and disappears entirely when I have passed it."

"Naturally," replied the Tester. "As a rule there is practically no resistance in a multiple short, but the resistance of the multiple wiring is quite appreciable. When you make this test current is flowing over one side of the multiple wiring, through the short, and back over the other side. When you plug your receiver in at the first section you bridge it across the battery, but with the multiple wiring between you and the short acting as a shunt around the receiver, and the current divides between the receiver and this shunt in inverse ratio to their respective resistances. As you go along the board the resistance of this shunt becomes less and less and a larger proportion of the current flows through it, leaving less for the deceiver, until when you reach the trouble the resistance of the shunt has become zero and no current flows through the receiver. After you pass the short you get no click because none of the current gets that far; it is all flowing through the short which is now between you and the battery. Of course you must use a low resistance receiver for this test, or else cut in an induction coil with a low wound primary, in order to get enough current through your receiver to give a definite click."

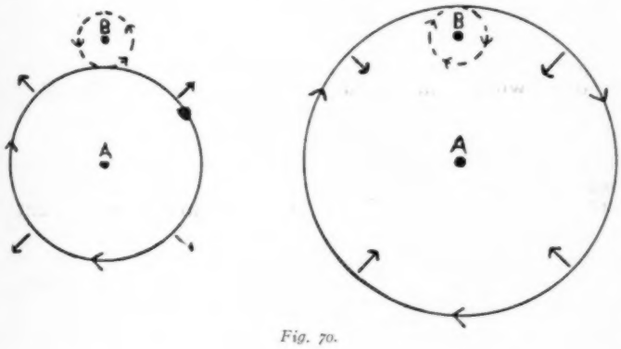


Fig. 70.

"This question may not have anything to do with shunting losses," said the Draftsman, "but in a good many of our circuits we have two or more resistances in parallel. How do you figure their combined resistance?"

"This may be done in several different ways," was the answer. "When there are only two paths the easiest way is to divide the product of their resistances by the sum. Take for example the two windings of the No. 108 relay in the trunk circuit which we discussed last month. After the called party has answered these two windings are in parallel, and their combined resistance is

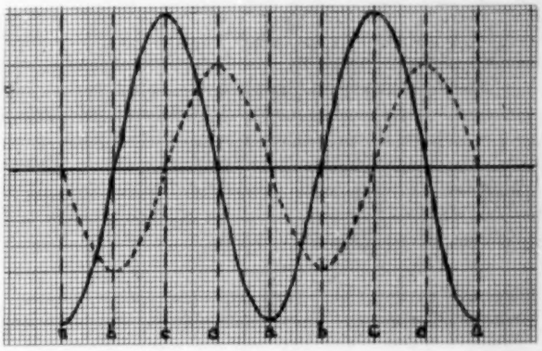


Fig. 71.

$$\frac{155 \text{ times } 10{,}000}{155 \text{ plus } 10{,}000}$$ or 153.6 ohms. When there are more than two paths we can put them in groups of two each, figure the resistance of each group, and then combine the groups. Suppose we take the three lamps which we were talking about awhile ago. The combined resistance of the eight-candle and sixteen-candle lamps is

$$\frac{440 \text{ times } 220}{440 \text{ plus } 220}$$ or 141 ohms. Combining this with the resistance of the thirty-two-candle lamp we have

$$\frac{141 \text{ times } 110}{141 \text{ plus } 110}$$ or 62 ohms."

"Are there any further questions?" asked the President. "If not we will go on to self induction."

"This is not quite so simple," began the Tester, "but it is one of the most fascinating subjects I know of, and one where it is wonderfully easy to get tripped up if you don't watch your step. The principles involved are not so bad if you have a fairly lively imagination, but to work out the actual figures in any given case requires some geometry and at least a little elementary trignometry. What we are after just now, though, is to get a general idea of why our apparatus works in the way it does, so that we will know what to expect of it and be able to figure out what some unusual behavior means, and for that purpose a knowledge of the principles is the main thing.

"Last May we found that a current through a wire set up a magnetic field around that wire, and that the field rotated in a direction depending on the direction of the current. If the current is flowing from us the field rotates right-handedly, or clock-wise; if the current is flowing towards us the rotation is left-handed. We also found that when this field cut through another wire parallel to the first it set up a momentary current in the second wire, and in that way found out in a general way how an induction coil works. In that connection self

induction was also mentioned, but in order to get a clear idea of it we must examine the action of this magnetic field more closely.

"We will take as the simplest case a purely alternating current having the form of a sine wave, such as that shown in Fig. 52. Since the magnetic field is set up by the current it is evident that its extent will depend on the strength of the current, spreading out as the current increases and contracting as the current decreases. When

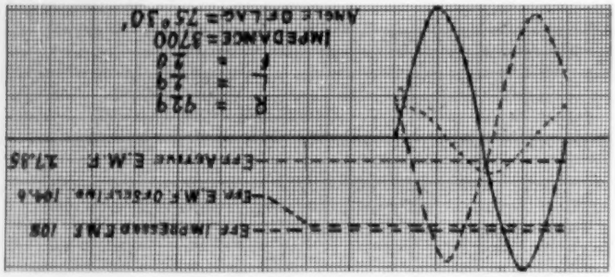


Fig. 72.

the current dies to zero the field collapses on the wire and disappears. When the current is alternating the field expands to a maximum, dies away to zero, and then expands again but rotating in the opposite direction, completing the magnetic cycle in step with the current cycle. Suppose we see just how these alternate expansions and contractions set up a current in a second wire.

"In this sketch we will let dot *A* represent the primary wire in which an alternating current is flowing, dot *B* a second wire parallel and close to it, and the circle the magnetic field set up by the current. Since the current is constantly rising, falling, and reversing its direction, this field is constantly expanding, contracting, and reversing its direction of rotation. Suppose for the moment that the primary current is flowing from us and increasing in volume, then the circle is rotating right-handedly and is expanding. As it approaches the second wire and is about to cut through it each point on the circle passes by the second wire in the same direction that it would if it were a point in a circle rotating around the second wire left-handedly. But a circle rotating around a wire left-handedly indicates a current flowing towards us in the wire, and accordingly we find in this case a current flowing towards us in the secondary wire.

"Suppose that the circle has reached the limit of its expansion beyond the second wire and is starting to contract as the primary current dies away. In contracting it must necessarily cut through the second wire again, but now in the opposite direction. As it approaches the second wire each point in the circle passes it in the same direction as it would if it were a point in a circle rotating around the second wire right-handedly, corresponding to a current flowing from us, or in the same direction as the primary current. From this we can draw the conclusion, then, that while the primary current is increasing in volume the secondary or induced current is in the opposite direction to the primary; while the primary current is decreasing, the secondary is in the same direction as the primary.

"Perhaps we can make this clearer by drawing the curves showing the rise and fall of the two currents (Fig. 71), the solid line representing the primary current and the dotted line the secondary.

"Since the induced current, or rather the induced electromotive force, is caused by the magnetic field cutting through the wire, its strength evidently varies with the rate at which the field is expanding or contracting, and this in turn is determined by the rate of change in the primary current. Starting at *a* for an instant the primary current is neither increasing or decreasing, the field is stationary, and there is no effect induced in the secondary wire. As we come up the curve we find it growing more and more steep, indicating an increasing rate of change in the strength of the primary current. The rise in the induced electromotive force is strictly proportional to this rate of change as shown by the dotted line. The curve of the primary current becomes steepest as it crosses the line at *b*, and the induced effect is greatest at this point. As we follow up the primary curve it begins to flatten out, and the induced effect becomes less until at *c* the current ceases to rise and the induced effect becomes zero. As we follow down the curve from this point the process is repeated, but in the opposite direction, until we reach our starting point at *a*. You will notice that the wave of the induced current is the same shape as that of the primary current, but lags behind it one-quarter of a cycle, or 90 degrees. When we are considering transmission through an induction or repeating coil this lag cuts no particular figure, but when we are considering self induction we will find that it is the key to the entire situation.

"It is evident that the induced effect is the same whether wire *B* in Fig. 70 is a separate wire or is merely an adjacent turn in the primary wire, and this is the only difference between an induction coil and a retardation coil. In an induction coil the induced electromotive force is in the secondary wire, while in a retardation coil it is in the same wire and hence reacts directly upon the primary current. This reaction of the induced electromotive force upon the primary current is what we mean by self induction, and to find out what self induction does all that is necessary is to find the resultant of these two forces.

"We have found that while the primary current is increasing, the induced electromotive force is in the opposite direction to the primary current; while the primary

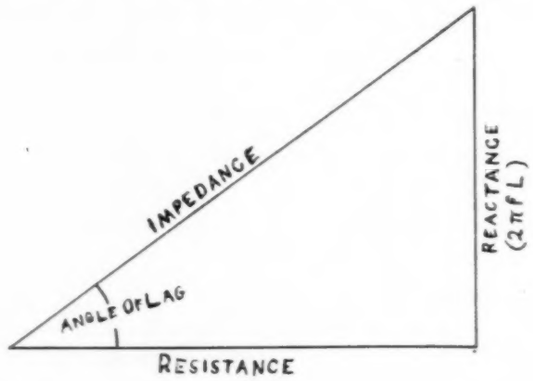


Fig. 73.

current is decreasing it is in the same direction as the primary current. When this takes place in the primary wire, as in the case of self induction, then, its effect is to oppose either a rise or a fall in the primary current. With an alternating current this increases the apparent resistance of the circuit, and to cover this increased apparent resistance we use the word impedance, which includes both the simple resistance and the reactance due to inductive conditions in the circuit. With fluctuating

current self induction simply smooths out the fluctuations and tends to hold the current steady.

"You were right when you said that self induction was less simple than a shunting loss," commented the Repairman. "What's all this got to do with telephone work?"

"It has a great deal to do with it," was the answer. "Every magnetic circuit has self induction, and telephone work is full of magnetic circuits. Ringers, receivers, and relays all depend on magnetism for their action, and in order to understand how they work it is necessary to take their self induction into account."

"That's a fact," broke in the Switchboardman. "An equipment man adjusted some of my trip relays once, using a pair of 1000 ohm ringers instead of a non-inductive resistance. I had my hands full before I got them straightened out. Just how much difference did that make?"

"I have some rather interesting curves on that," replied the Tester, "which I plotted from actual measurements on a pair of ordinary ringers a few years ago. Their resistance was 929 ohms and I used alternating ringing current at 108 volts and 20 cycles.

"The solid line represents the impressed electromotive force as delivered by the ringing machine, the long dotted line the electromotive force of self induction, and the short dotted line the active electromotive force which is available for actually driving the current.

"These curves are typical of the conditions in any self inductive circuit and show how self induction both cuts down the current and causes it to lag behind the changes in the impressed electromotive force.

"In studying these curves we must remember that self induction is a magnetic phenomenon, and that magnetism is set up by a current, not by electromotive force. The current is in step with the active electromotive force which is driving it, and accordingly we find that the curve showing the electromotive force of self induction is 90 degrees behind that of the active electromotive force or current. Since the active electromotive force is the resultant of the other two it must lie somewhere between them, lagging behind the impressed electromotive force to an extent depending on the amount of self induction present and on the frequency of the current, in this case 75° and 30′. Since the electromotive force of self induction is 90 degrees behind this it is largely in opposition to the impressed electromotive force, and this opposition is what cuts down the current or increases the apparent resistance. In this case the apparent resistance or impedance is 3700 ohms, so that your equipment man adjusted your relays practically on 3700 ohms instead of 1000."

"Do you mean to say," inquired the Repairman, "that a pair of 1000 ohm ringers is actually equal to 3700 ohms in practice?"

"That depends on the other conditions in the circuit," was the answer. "If the ringers are connected directly to the generator without a condenser and with no other resistance in circuit that is about a fair average, the exact impedance varying somewhat with the design and adjustment. In practice we usually ring through a condenser and always have some resistance in circuit, and both of these reduce the effect of the self induction. With this same pair of ringers, for example, cutting a 2 mf. condenser in series with them brought the impedance down to 2300 ohms, and at the end of a long line, with a trip relay and other apparatus in series with them, the impedance of the ringers would be still less. You would always, however, find it considerably greater than the simple resistance."

"How did you get these curves?" inquired the Wire Chief. "I have seen something like that in an oscillagraph, but don't see how you get the exact values that way."

"An oscillagraph is invaluable for giving an actual picture of conditions," answered the Tester, "but actual values can be obtained better in other ways. In this case I measured the impressed electromotive force by means of an ordinary alternating current voltmeter, measured the impedance directly by two or three different ways, and then worked out the other values by a right triangle. (Fig. 73.) In this triangle one acute angle is made equal to the lag of the current behind the impressed electromotive force, the adjacent side represents the simple resistance of the circuit, the opposite side the reactance due to self induction, and the hypothenuse shows the impedance. The value of π is, as I presume we all know, 3.1416, f represents the frequency in cycles per second, and L the inductance in henrys. I have used two words here, by the way, which we have not discussed before, 'inductance' and 'henry.' Inductance is simply the coefficient of self induction and its unit is the henry, just as the unit of resistance is the ohm.

"In the case of the ringers which we have used as an illustration, the resistance as measured by an ordinary bridge was 929 ohms, and the impedance was 3700 ohms. Having two sides of the triangle, it was easy to find the third by the familiar rule that one side of a right triangle is equal to the square root of the difference between the squares of the hypothenuse and the other side. This gave the value of the reactance, and since L was the only unknown quantity in this its value was easily figured. Having the sides of the triangle, any table of functions will give the angle representing the angle of lag.

"We have considered so far only the case of an alternating current having the form of a pure sine wave. With ringing current obtained from the usual type of machine we have a fairly close approximation to this ideal condition. When the current is obtained from a pole changer the case is not quite so simple, and when we consider the problems which arise in connection with the transmission of speech about the only limit is the extent of our mathematical training. The reason for this is that telephonic frequencies cover a wide range and are in all cases extremely high as compared with the frequencies used in ringing, in lighting, or in the transmission of power.

"If we examine, either mathematically or by means of an oscillagraph, the wave form of the current in a telephone line, we will find that instead of the simple curve shown in Fig. 72 we have a curve which is exceedingly complex and irregular in shape. It has been found, however, that any such curve can be analyzed into a group of sine curves of different frequencies, and the frequencies which are most important in telephone transmission have been determined. There is only one point which is of any particular importance to us just now, and that is—referring back to Fig. 73—that as we increase the frequency we increase the vertical side of our triangle and that in turn increases both the impedance and the angle of lag. In other words, when we have self induction in a circuit the widely different frequencies which make up a complex speech wave are not all retarded to the same extent, but the higher frequencies suffer more, both in loss of volume and in lag, than the lower. This not only cuts down the loudness of the speech but

distorts and muffles it until—if there is very much self induction present—it becomes utterly unintelligible. For this reason, to take the most common illustration, all relays which it is necessary to talk through must be shunted by either a condenser or a non-inductive shunt."

"I had a case in point just the other day," broke in the Repairman. "One of my pbx subscribers had been kicking for a long time about poor transmission, and I finally found one of the wires broken off at the clip on the relay. The relay worked all right, but they couldn't seem to talk through it."

"Exactly," commented the Tester. "I remember that case, for we all thought that the subscriber was just a chronic kicker. Perhaps that case will answer the question you asked awhile ago as to what all this had to do with telephone work."

"You're right," agreed the Repairman, "but just what is a non-inductive shunt and how does it work?"

"It is a non-inductive winding shunted around the inductive or magnetizing winding," answered the Tester. "A non-inductive winding is made by taking a piece of german silver wire of the required resistance, doubling it in the middle, fastening the doubled portion to the frame, and winding the two halves side by side, bringing the two ends out together. When the current starts in at one end of the winding it goes around the core in one direction until it reaches the middle, then doubles back and goes through the other half in the opposite direction. The magnetic field—and therefore the inductive effect—of one-half of the winding is in the opposite direction and neutralizes that set up by the other half. In a relay which we have to talk through we proportion the resistances of the two windings so that the magnetizing winding will get enough current to operate on while the non-inductive shunt provides a sufficiently low resistance path for the speech fluctuations to prevent a serious transmission loss. In the No. 118 A or AC relay, for example, the magnetizing winding is 21 ohms and the shunt 31."

We have touched upon some of the real problems of telephone work tonight, and it is getting rather late," the President remarked at this point. "I suggest that we leave the rest of this subject for our next meeting, and that in the meantime we think over the points we have been discussing tonight, and let them 'soak in.'"

The motion was put and carried.

(To be continued.)

Announcement to Engineers

The American Association of Engineers is accomplishing some good results by educating engineers to co-operate with each other and with their employers. The Association's service clearing house has obtained more money for some of its members because they have been advanced into higher positions, for which they were qualified. It is granted that many good engineers are poorly paid, but it is very true that others are not worth more than they receive if their commercial or business value to their employers can be measured by their ability to sell their engineering service for a fair price. Many men who call themselves engineers are not making a living plus six per cent interest on their investment for education and training. A man's business ability can best be gauged by his financial record, but the average engineer who is seeking employment is very sensitive when asked about his last year's salary. A man may have had several years' experience in private consulting engineering, but that does not show his business ability unless he states the net amount from such business. Ability is depreciated unless it is all well paid for.

If technical men do not combine some of the teaching received in college about efficiency of machines, complicated formulae, never to ask an employer for a raise, value of diploma, etc., with the objects of this Association, they will not be able to gain the commercial or social position due an engineer. The employer wants the engineer who has business ability and an engineering knowledge.

This association is securing for membership those engineers who have a desire to better the standards of ethics of the engineering profession and to co-operate with its members for the purpose of gaining a fair compensation for all engineering services rendered. Membership dues are $10 per annum. All engineers with degrees, technical educators, chemists, draftsmen having at least two years' experience and all practical engineers with at least five years' experience in the field are eligible for membership.

The association's qualification committee acts as a board of examining engineers who will check the member's qualifications so that the proper men can be recommended to fill positions. Employers want full value for what they pay, and it is the engineer's duty to repay them by service. Give to them your very best efforts and you will soon have all employers co-operating with the American Association of Engineers.

The objects of the association are to raise the standard of ethics of the engineering profession and to promote the economic and social welfare of engineers: 1st, by affording means for the interchange of information; 2nd, by maintaining a service clearing house; 3rd, by affording patent and legal advice; 4th, by supervision of legislation; 5th, by proper publicity.

All engineers, technical educators, wire chiefs, and others interested in the objects of this association are invited to attend a booster dinner to be held at La Salle Hotel, Chicago, on Sept. 14, 1915. Prof. F. H. Newell, who is head of the Civil Engineering department of the University of Illinois and who was director of the U. S. Reclamation Bureau, will speak on the need for organization.

A national convention is to be held at the Hotel La Salle, Chicago, on December 10 and 11, 1915. All engineers are invited. All clubs and societies in the United States of America are urged to be represented by engineering delegates. Those interested may obtain further information by addressing Arthur Kneisel, secretary, 29 South La Salle street, Chicago, Ill.

Requests for Fire Information Discouraged

In former times in Muscatine, Iowa, when the fire calls came in, the supervisor passed down the line of operators and informed each girl where the fire was located that they might tell the innumerable callers who requested the information. Every time there was a fire, the telephone board became peppered with the lights of inquiries and the resultant work necessary was a heavy burden upon the operators, who in their limited number here are already crowded in their duties. For this reason, it was decided that inasmuch as it was impossible to do so, the practice would be done away with. Therefore, when the fire call comes in, the operator who receives the call tells the chief operator and there the matter ends.

The other operators are not informed and they are telling only the truth when they reply to requests that they do not know.

Putting a Stop to the Mergers

What Was Done in Tennessee and Can Be Done Elsewhere

BY R. W. HARRISON*

THE Clarksville, Tenn., sell-out has been temporarily blocked, although the money ($47,000, we are told), has already changed hands. The only way for the deal to be consummated will be to junk the entire Clarksville Independent plant. At least the Bell System has found that some Independents are red-blooded enough to resent a ruthless violation of the law.

The result at Clarksville has been achieved by a mere handful of Independent operators who live in the section of the country affected by the Clarksville sale. It seems that all that was necessary to get proper action started was for some one to touch the match.

If results such as this can be secured in a few weeks by only a few men surely we are neglecting our opportunities in not co-operating along constructive lines to prevent the possibility of such mergers in the future and to the end that Independent telephony may come into its own and that we may achieve the destiny that we all feel is rightfully ours.

If the theory of Independent business is not all wrong, if it has been beneficial to the public, and if there is a possibility of its being successful and proving remunerative to those men who devote their efforts to it; if competition is a good thing; then we owe it to ourselves, to the public, and to Providence to place not only our own individual plant or plants, but all Independent telephony at large, on such a basis that it will prove of more benefit to the public, more remunerative to ourselves, and so successful that it will be impregnable to attack through any methods by our competitors.

The Bell Company makes great publicity capital out of the fact that the United States has the greatest telephone development, the best telephone service and the lowest telephone rates of any country in the world. It advertises for the benefit of the layman that this condition is due to the Bell System solely, and is all a direct result of the efficiency of the organization of the Bell System and of the well known philanthropic policies which they (the Bell people) accredit to the Bell System. Of course, we all know that the admirable telephone condition in the United States is directly due to competition. No one who thinks constructively believes that monopolistic conditions ever have or ever will evolve the best of service at the lowest rates.

The achievements in the telephone world that mark the rapid evolution since the first organization of the American Bell Telephone Company of Massachusetts are due in no sense to a desire on the part of the Bell System to give the public all that it deserves for its money. The application of improvements, whether made by the Bell System or the Independents, has been directly due to the necessity of existing under competitive conditions. The public should become fully conversant with this fact, among many others, and it can only be made to realize this through systematic publicity given by Independent telephone interests. Only organization on creative lines can do this.

Have you faith in your business? Do you expect to make a success of it? Or are you hoping to sell out your associates and profit, Judas-like, by a sale to the Bell System? If the first, you must realize that your competitors are part of the greatest business organization that this commercial age has yet evolved and that only organization along like or better lines can save the Independent industry. If you belong to the class that would answer the third affirmatively, and expect to prostitute the faith reposed in you by your associates, you are entitled to no part in councils held by Independent telephone men. Certain it is that while some mergers serve to remove cancerous growths from the body of Independent telephony, they also take with them vital organs, the loss of which is irreparable. If some such secret desire to sell to the Bell System has fostered itself in your mind in the past, accept your responsibilities, act the man, cast it out, and enlist with your whole-hearted interest and efforts in the Independent cause. Help organize and help build up the successful Independent organization which must evolve. The opportunity is ours and now seems to be the time of all times to take advantage of the opportunity. The Postal Company is arranging for long distance connections between isolated Independent plants and is making possible an advantage over our competitors in the matter of toll rates. Surely because of this and other conditions now existent we should strike while the iron is hot.

At the present time we are totally unprepared for war and are unable to repel the invasions which are being made by the Bell System on the individual strongholds of Independent telephony. As business men and as factors in the evolution now under process in this most wonderful commercial age we must accept our responsibilities and, if possible, achieve such results as will guarantee that these invasions of the Bell System may be repelled. When we have reached that condition where we are entitled to the full respect of ourselves, of each other, and of the public, we are in a position to consider and to pursue aggressive tactics.

We seem to have overlooked a few bets in the past, due to lack of organization and to a policy which prevents our profiting by the mistakes of each other. The vast number of mutual companies throughout the country are proving of practically no benefit to Independent telephony due to a lack of co-operation between them and the stock company Independents. In Middle Tennessee, all along the Upper Cumberland Plateau, the writer and his associates have organized a long distance company tapping every one of the mutuals in this territory and are making possible Independent toll service into Nashville right now, and are selling it on a remunerative basis. When the Nashville Independent plant is built this will prove of immense value both morally and financially. The same can be done in hundreds of other localities if the proper methods are employed to get beneath the outer armour of hostility worn by the mutual men, and their real Independent core reached, so that both their spirit and facilities may be developed.

These mutual companies are all subject to development by Independent telephone men, and especially are they valuable when we consider toll development possibilities. Surely we are acting unwisely when we fail to make arrangements for physical connections between the larger Independent plants and the mutual companies, and

*Secretary, Automatic Telephone Company of Nashville, Tenn.

are suffering from the mutual movement when we could profit by it.

For years the Bell people have had the fiction and technical magazines practically subsidized through their heavy advertising contracts; and because of this subsidence, and through the results obtained from their most efficient publicity bureaus they have succeeded in deluding the public into the conviction that the Bell's slogan, "One Policy, One System, Universal Service," typifies the ideal telephone service.

This conviction is false, as we know and can prove, and the "proving" will mean success for the Independent cause. The first step towards the execution of this proof, however, is organization and publicity.

Let us stop telling each other that the Kingsbury letter constituted a contract, and that the Bell people have violated that contract. We all know that. Instead let us get busy and act.

President Wilson said in his letter relative to the Kingsbury letter: "So long as we are dealt with in this spirit, we can help to build up the business of the country upon sound and permanent lines." If Mr. Wilson was sincere, and most of us believe he was, he expressed a desire in the above partly quoted paragraph to assist all business to place itself upon a sound and permanent basis. It is up to us to help him realize this desire, for it is our business that will be built up "upon sound and permanent lines."

To secure the proper co-operation from the government we must acquaint it with the violations of the Bell people and must prove worthy of the government's protection. To do this we must be organized.

We are entitled to many things which we are not now receiving, and if we receive them the public will secure those things to which it is entitled. We are entitled to physical connection both local and long distance, and that too, on an equitable basis. If we secure this it means ultimate success and the only way to secure it is through perfect organization.

Despite the whole-hearted interests of the members and officials of our national organizations and our many district organizations we are not working in concert to preserve what we have, nor to secure new business and the firmer status that is rightfully ours. As an evidence of the lack of co-operation and inter-interest organization we see the existence of two great Independent associations with a sad lack of co-operation between them. The policy which makes possible the existence of these two national associations instead of the welding of the two into one is a suicidal policy and is, of course, the thing most desired by our competitors.

Realizing, as we must, our plight at this time, we will surely exert that inalienable right of the American citizen to self-defense and take whatever steps are necessary for defense. To my mind the first step is organization on creative lines. If I am wrong, tell me so, and tell me what is the right step. Whatever it is, I can be counted on for my whole effort in every way, to the end that Independent telephony may achieve that ultimate destiny to which it is entitled.

It is never wise to acquaint your opponent with your method of campaign. Therefore it is unwise to make any mention in these columns of our proposed procedure. I would be glad, however, to receive any comments or suggestions, whether favorable or otherwise, written to the writer in care of Telephone Engineer. Wake up, you Independents, and let us get action!

Field Telephones in British Army Service

Before the Royal Society of Arts on July 28, Chas. R. Darling delivered a special war lecture, with experimental illustrations, on "Field Telephones." The speaker dealt with the duties of the field telephonist, and with the components and operation of field telephones as now used in the British Army. The Japanese were the first to make extensive use of the telephone in large scale warfare, and, during the past year of trench warfare, the telephone has proved an indispensable and generally the only practicable means of communication in the fighting zone.

As source of current two small dry cells are invariably employed. These rapidly become exhausted, and the range of voltage for satisfactory communication is only from 1·5 to 1·3 volts per cell. A high-pitched buzzer is used for calling purposes and also for telegraphic communication by Morse code. Speech transmission is rarely practicable near the firing line. To save weight and space the induction coil and buzzer may be combined in a single apparatus, and the latest service buzzer, the D-Mark III, with bipolar, double-wound magnets and a double-ended reed oscillating about its centre, gives a remarkably pure and even note, considerably better than that given by older patterns of buzzer with reeds vibrating about one end. Watch pattern receivers and carbon granule microphones are invariably employed. With a head receiver strapped in position, a sleeping operator is awakened with certainty by the calling buzzer. Earth return is always employed, and since the receiver cord forms part of the line circuit, there is special advantage in using two receivers in parallel, apart from the possibility of two persons then listening at once to important messages. The standard D-Mark III field set, complete with leather case, weighs just over 8 pounds. Certain privately-manufactured sets, which are now being used in addition to the service equipment, are a little lighter, but have not the special Mark III buzzer.

For quite temporary communication, the Japanese practice of using single iron wire lines varnished for insulation, is generally followed. Such wire is not worth picking up again. More permanent installations demand the use of stranded steel wire with weatherproof insulation; copper is never used, chiefly on account of the ease with which it is broken. To prevent frequent interruption of service by spies cutting wires or by shell splinters breaking the lines, an irregularly-constructed "ladder" line is often used, this consisting of two main lines interconnected by as many "rungs" as possible. Many branches in the network thus formed may be broken before through communication is interrupted, but it is not always easy to make the numerous joints required when laying the line, and earth faults at breaks may place the line out of service in wet localities before through connection is broken. An alternative is to provide multiple conductors brought into one or more intermediate "dug-outs," but not interconnected by rungs. Operators in the intermediate dug-outs test the lines at frequent intervals and make cross-connections as required to replace a broken section of one line by the corresponding section of one of the other lines available. A broken line being thus disconnected, gives no trouble by earth faults.

In conclusion, Mr. Darling pointed out that drill discipline and bravery were not sufficient to make a useful telephonist. Knowledge of the construction and methods of working and repairing instruments were essential.

The Telephone Scrap Book

Curious and Useful Items, More or Less Telephonic, Gathered from Everywhere

A Telephonic Eye for the Blind

SEVERAL years ago the public was first acquainted with an apparatus devised by Fournier d'Albe to enable the blind, by means of auditory impressions, to detect the varying intensity of light in their neighborhood, and thus to guide themselves to light sources, to know when they were entering a shaded place, or when night had fallen or day had dawned. The operation of this instrument, wonderful enough at the time of its invention, depended on the outstanding property of the element selenium to change its electrical resistance according to changes in the intensity of light falling upon it. In other words, for a given light intensity applied to the element it presents a corresponding resistance to the passage of an electric current through it. This apparatus, while marking an epoch, was hardly of sufficient practicability to be in demand by many among the blind.

In the crystal phonopticon recently devised by Dr. F. C. Brown of the State University of Iowa use is made for the first time of individual crystals of selenium, which Dr. Brown, with others of the physics department of that institution, initially produced. By these crystals the problem has been tremendously simplified, indeed finally solved. Some idea of what has been accomplished in a very few months toward making a print-reading device thoroughly practicable for every blind person, in fact a necessity rather than a luxury, may be gained from the few facts which follow.

On the first and second of July of this summer Dr. Brown exhibited his apparatus before the annual convention of the American Association of Workers for the Blind, held at San Francisco. Out of some thirty blind persons tested, all, in but two or three trials, could distinguish with certainty such letters as *A, W, L, O, I.* D. S. Weider, in charge of certain work in the shops for the blind at the University of California, himself blind, learned to distinguish a large number of letters with extreme ease, and without any previous experience with the phonopticon. The three words, "at," "the," "nine," were given him. Having heard them only twice, he could distinguish these words without failure. They were in print of a size having 3-millimeter capitals. In the opinion of Mrs. Rider, in charge of the literature for the Blind at the Congressional Library, Washington, D. C., Mr. Weider's reading of the words was "surprisingly rapid." Mr. Weider, quickly grasping the idea of the phonopticon, offered to assist in the demonstration by illustrating on the pipe organ the sounds of different letters. For example, the letter *W* would have a sound similar to the successive notes *me-do-me-do-me*, while *A* would sound like *do-me-do*. This will be better understood after a description of the phonopticon has been given. The most interesting and exacting test came when Miss Rider suggested that, with Mr. Weider at the phonopticon, a letter unknown to him, and one that he had not previously heard, should be given him. This was done, and having requested a second hearing of the letter, Mr. Weider named the correct one. Dr. Newell Perry, himself sightless, in charge of teaching work at the State School for the Blind at Berkeley, and president of the National Society for the Higher Education of the Blind,

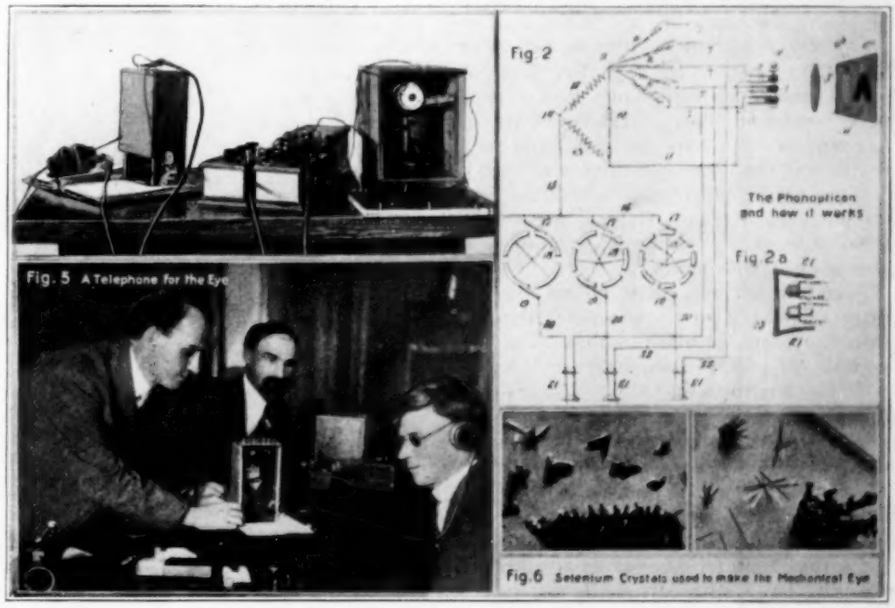


Fig. 5 A Telephone for the Eye
Fig. 2
The Phonopticon and how it works
Fig. 2a
Fig. 6 Selenium Crystals used to make the Mechanical Eye

Operation of the Telephonic Eye.

has become one of the most interested in the new invention. In fact he has been closely following its development. He found little difficulty at the San Francisco convention, where he had his first opportunity of using the instrument, in distinguishing letters. It is estimated that in two months' time a blind person of average ability can learn to read with the phonopticon.

Fig. 2 shows schematically the working of the instrument. The page, bearing the letter *A*, for example, lies before a lens. The page remains stationary while the lens (5) and the selenium crystals (1) are moved together over the line of letters. A bright band of illumination (6*b*), whose source is not shown in the diagram, moves with the lens and illuminates strongly each letter in succession. Let the band of illumination be in the position indicated, and approaching the letter *A*. As the successive parts of the letter come into the light their images are thrown by the lens on the corresponding crystals; the upper crystal will receive the successive images of the lower parts of the letter, the lower crystal those of the upper part of the letter, and the central crystal the images of the central parts. The lower left part of the *A* enters the illuminated region first, and the upper crystal will be the first to respond. Next, the central crystal will respond, and by the time the lower crystal is reached, the

upper one will have ceased to respond, as the lower left part of the letter has passed out of the region of illumination. The central crystal will continue to act, due to the continuance in the band of the horizontal line of the *A*. As the letter passes on, the lower crystal will cease to respond, because the apex of the *A* has passed out of the band. Next, the central crystal will cease to act soon after the upper crystal responds to the entrance into the band of the lower right part of the letter. Likewise the upper crystal will be the last to cease action. It is thus seen that every letter of the alphabet, and in general any character whatsoever, will have its characteristic sound.

In the same figure the diagram of electrical connections shows how the responses of the crystals are made evident in telephone receivers. Each crystal forms an arm of a Wheatstone bridge. The telephone received for that crystal replaces the galvanometer of the Wheatstone bridge as ordinarily used. Three telephone receivers are drawn in the diagram, but if three or even more crystals need to be used, the solution in behalf of only two ears is seen from Fig. 2 of this diagram. According to this figure, with two telephone receivers four crystals are readily accommodated. However, the instrument appears to give very good results with only two crystals, one for the upper, the other for the lower part of the letter.

In series with each telephone receiver there is an interrupting device giving a definite frequency to the current, and a resonating arrangement in the receiver changes this frequency to one of definite musical pitch, a different pitch for each crystal. It is a change in the intensity of one of these pitches that marks the entrance into the band of illumination of a region of darkness, such as a portion of some letter.

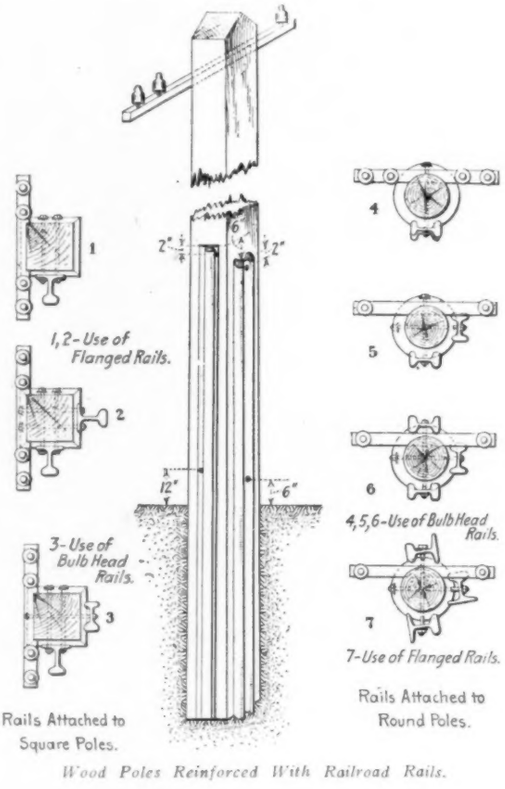
The photograph, Fig. 1, shows the whole apparatus in its present stage of development. The total weight is only 35 pounds, while the mechanical eye, which is the upright closed box, shown in position for reading from a book, weighs but 2 pounds, and its weight can probably be reduced to a fraction of a pound.

This box contains the crystals (which respond to the light in a manner similar to the action of the rods and cones of the human eye), the source of illumination producing the band of light on the page, and the necessary lenses, together with some minor parts. The lens and crystals as shown in Fig. 2 are mounted in the box, so that with the page lying horizontally upon a table the line joining them makes a certain angle with the vertical.

In this arrangement there is a source of light, such as the filament of a Nernst glower or of a special incandescent lamp, the lens to focus the light on the letter on the page, through an aperture in the bottom of the box, the lens system to receive the reflected, or diffused, light and focus it, in the form of an image of the illuminated part of the page, upon the crystals. The mechanical eye is seen with the cover removed in the large photograph, Fig. 5.

Reinforcing Wood Poles With Railroad Rails

THE lasting properties of the timbers used for poles in New Zealand are fairly high. The wooden poles used are for the most part square, sawed, or hewed from heart timber. There are poles now carrying about a dozen No. 8 wires which were erected as far back as 1869, and which have had no supports or other treatment to prolong their life. The bulk of the poles, however, require some attention after standing from twenty-five to thirty years. Some twenty years ago the writer adopted a scheme of inserting short lengths of old railway rails at the base of the defective poles to reinforce them, says J. Orchiston, chief engineer of telegraphs for New Zealand, in the *Electrical World*. When this method is used a hole is dug along-side the pole the same depth as the original hole for the pole, usually from 4 to 6 feet. The rail butt is then placed against the pole and secured by means of two 5/8-inch bolts passing through the pole and holes drilled in the rail butt. One bolt is placed about 6 to 9 inches above the ground line, and the other about 2 inches from the top of the rail butt. These rail butts vary in length from 7 to 15 feet, usually 8 to 9 feet for ordinary straight-line poles and 10 to 15 feet for angle poles. No hard and fast rule is followed in regard to the length or dimensions of these rail butts, as they are invariably scrap ends and a by-product of all railway systems. The weight varies from 40 to 110 pounds per



Wood Poles Reinforced With Railroad Rails.

yard, the lighter weights being used for the smaller poles. Many thousands of our poles have been so treated at a cost of from one-sixth to one-tenth of the expenditure which would have been incurred had the poles been replaced by new ones.

This system of reinforcing standing poles obviously saves any refitting or alteration of line wires, and as the timber above the ground is probably good for a century, a pole with two rail butts attached to the base is practically stronger and more dependable than a new pole, although it may be thirty or forty years old. The method adopted is also a great relief to an overhauling foreman. When he must decide regarding a doubtful pole he does not need to consider whether or not to go to the expense of replacing it with a new one, for when in doubt he simply attaches a butt and passes on to the next pole. If the pole is in poor condition on account of decay, he

usually uses two butts. In many cases a single butt has been inserted, and a dozen years or so afterward a second one is installed on the opposite side if the pole has deteriorated much in the meantime. In numbers of cases the poles have completely rotted off at the ground line and are wholly supported by two rail butts. The accompanying diagrams show the methods of fastening rail butts to poles. For round poles bulb-head rails are preferable and flanged rails for square poles. The use of both types is shown in the illustration.

The writer believes the method outlined will be found more economical and reliable than that of incasing the base of the poles in concrete. It is also more flexible.

Depression Not Due to War

Business depression is not the direct result of the European war, but the logical and inevitable result of the campaign carried on by the federal and state governments against railways, utility companies and the larger manufacturing and producing corporations, according to B. E. Sunny, president of the Chicago Telephone Company.

"Many people are mystified at the vast amount of want, idleness and starvation all over this country where peace reigns, where crops have been abundant and where for years there has been sufficient," he said. "They ask, 'why the mills have shut down,' 'why the erection of new buildings has stopped,' or 'why the railroads have ceased building extensions and improvements.' The answer by some is that the war is responsible, and this is an error.

"Some lines of trade have been hurt by the war, but others benefited. On the whole, we have been helped. Business depression had set in, and was acutely felt in many lines months before actual hostilities began.

"It was the logical and inevitable result of the campaign carried on by the federal and state governments during the last ten years against the railways, utility companies and the large manufacturing and producing corporations.

"It is a notorious fact that Congress in session is a disturber of business. When Congress adjourns a hallelujah is sung all over the country."

Ohio Expects Advantages from Merger

Purchase of the Akron People's Telephone Company by the Ohio State Telephone Company will increase the strength and earning power of the new Independent organization. It increases the total stations of the company in Ohio to approximately 107,000. While the acquirement of the Akron properties by the Ohio State Company was essential to the carrying out of its scheme of development and reconstruction, it was equally necessary to the improvement of the Akron telephone situation. Like similar independent properties throughout Ohio, the Akron company for several years had been unable to finance improvements and extensions on a scale such as the possibilities and requirements of the service demanded. Practically all of the betterment has been done from earnings which, because of their smallness, limited the work. President McMeen of the Ohio State company stated that the plants of the Akron company would be included in the improvement and extension program of his organization. He explained that the financing for this would be done, as the Akron company could not do it, and that the operation of the properties could be enlarged and bettered without increasing the expense.

Sioux City Asks Two Minute Charge

Efforts will be made by the Sioux City, Ia., board of trade to obtain legislation that will compel telephone companies to permit the use of toll lines with a two-minute charge instead of the three-minute charge now in general custom. The plan now under consideration will be to bring the matter to the attention of legislators in South Dakota and Iowa with the view of having bills introduced for the purpose of compelling the short time charge for long distance messages.

Attorneys for the board have been advised to take the matter in charge and prepare a bill with the view of having it introduced in the legislatures of the two states. M. King, president of the board, stated that business men throughout the city were strenuously objecting to a charge for three-minute conversation as a minimum, when a one-minute talk would answer the purpose for seventy-five per cent of the business transacted over the long distance lines.

Board members say that the three-minute minimum recently put into service by the South Dakota railroad commission has been the means of increasing cost of telephoning for Sioux City business houses fully one-third. They point out that when Sioux City had the two-minute minimum charge the rates to such points as Geddes and Platte, S. D., were 60 cents, but under the present system the cost is 90 cents, although few messages ever run over the two-minute time.

The action of the board of trade has come as a result of the recent conference with Omaha telephone men.

Predicts Wireless Telephone for Long Distance

That the wireless telephone will be used for all very long distance conversation in the reasonably near future is the opinion of Dr. Michael I. Pupin of Columbia, whose invention of the loading coil made possible, as much as anything else, it is said, transcontinental telephoning, as demonstrated recently by the American Telephone and Telegraph Company. Dr. Pupin stated that he was working to perfect an instrument for wireless telephony that, he felt confident, would make possible conversation over practically any distance.

This means, according to the inventor, that the long-discussed telephone cable under the Atlantic will never be laid. People will be talking from New York to London without wires long before cable conversation could be accomplished, Dr. Pupin thinks. He believes, too, that wireless telephony for long distances will supersede wire transmission on land as well.

This view of the progress of the telephone in connection with the declaration of Peter Cooper Hewitt that talking to Europe would soon be possible, indicates that scientific minds still admit that the use of electricity is yet in its infancy.

Tampa Free Telephones to Be Discontinued

Application has been made in the Tampa circuit court in behalf of the State of Florida for an injunction against the Peninsular Telephone Company restraining that company from giving the city of Tampa the use of twenty free telephones and thirteen other telephones at special rates, as is being done according to an agreement specified in the company's charter, on the ground that this constitutes a discrimination against other telephone users. The court is also asked to restrain the company from granting free service to eight churches and charitable institutions and special rates to thirty ministers.

ASSOCIATION NEWS

by THE INDEPENDENT TELEPHONE ASSOCIATION OF AMERICA for
1504 Association Building, CHICAGO, ILL.

BY W. S. VIVIAN

WHEN the press of the United States announced something of the contents of Mr. Kingsbury's letter to the attorney general of the United States, under date of December 19, 1913, it was the common belief in the minds of hundreds of Independent telephone companies throughout the United States, that at last the Bell Companies were going to do the right thing. They believed, from the contents of the letter as first announced, that the Bell Company not only was going to stop its practice of buying Independent telephone properties, but that in addition its long distance system was going to become accessible to the Independent companies under fair and equitable terms and conditions. Largely because of this letter, the Federal department stopped its proceedings in the Portland case—so called. Nearly two years have elapsed since that letter was written and it is only fair to say that the Bell companies have signally failed to carry out either one of the promises as commonly understood. Judging from newspaper reports, there is a larger merger program under way today and more places affected than at any other one time in the history of the Independent telephone business. During these twenty months and more that have elapsed since the Kingsbury letter was written, the I. T. A. of A., through its officers and committees, has not been idle. At first it was believed the letter was written in good faith, consequently time was allowed the Bell companies to work out their proposition. In March of 1914 Mr. Kingsbury, with some of his assistants, presented a form of contract which was impossible for the Independents to accept, as it was altogether one-sided, unfair and unpractical. Certain counter demands were made by the association and little by little from March, 1914, to the middle of January, 1915, during numerous conferences, slight modifications were made. In March of 1915 it was announced by Mr. Kingsbury that the modified contract could not be secured by any Independent company unless this contract as submitted would be accepted in complete settlement of all controversies at this time. This, of course, made it utterly impossible for the Independents to accept the contract. Beginning in September, 1914, the board of directors of the I. T. A. of A. began considering the advisability of taking this entire matter to the Interstate Commerce Commission and began at that time to get some legal counsel and advice on the question. This matter was considered up to May of the present year, and an opinion was secured from one of the best firms on Interstate Commerce law that could be found in the United States. This firm finally rendered an opinion, one paragraph of which we quote:

> It is our opinion that the provisions of the act to regulate commerce quoted above, established the right of any person, company, firm or corporation, whether interested as the owner of the telephone exchange, or as a user of the telephone, to make complaint before the Interstate Commerce Commission, based upon the refusal or neglect of any telephone company to establish voluntarily, through routes or joint rates, and that said provisions also authorize and empower the Interstate Commerce Commission to establish such through routes and joint rates.

This opinion has now been in the hands of different people for nearly three months, and so far nobody has filed any opinion contrariwise. In considering action before the Interstate Commerce Commission this problem confronted the association: that it would have to have a sufficient amount of funds in sight to carry any action clear through to a successful conclusion before any action whatever was started.

Furthermore, after such action was started, what would be required before such action was concluded was unknown, as it would depend upon the conclusions of, first, the Interstate Commerce Commission, and second, the Supreme Court of the United States. And it might mean before we got through that the commerce law might have to be changed, although our attorneys hold that the law as it now stands will secure to us our rights along fair and equitable lines. The association's general counsel, Walter E. McCornack, also agrees with the opinion referred to. After seriously considering this matter, the board of directors decided that no action should be taken until a fund of at least $25,000 was pledged to the support of the undertaking. Such an amount of money would not be wanted at once, or in fact might never be wanted, but a sufficient fund should be pledged so as to be available if it were needed. As a result, a subscription blank was drawn up as follows:

SPECIAL FUND.

For the Purpose of Raising a Fund of
TWENTY-FIVE THOUSAND DOLLARS ($25,000.00)
to be used by the
INDEPENDENT TELEPHONE ASSOCIATION OF AMERICA
19 South LaSelle Street, Chicago, Illinois

in taking such action, legal or otherwise, as may be necessary to compel the American Telephone and Telegraph Company and its subsidiaries to establish an interchange of long distance service with Independent telephone companies .....

of .....

operating ..... Telephones, and ..... Circuit Miles of Toll Line,

a total of ..... units, hereby guarantees to said Association four cents per unit each year for two years, (a total of eight cents per unit) on all units owned and operated by said Company, which would amount to ..... Dollars, same to be payable in ten equal installments as called for by said Association.

This subscription is made on the express condition that a maximum sum of Twenty-five Thousand Dollars ($25,000.00) be subscribed; this subscription being a part of said Twenty-five Thousand Dollars ($25,000.00).

Dated this ..... day of ..... 1915.

..... NAME OF COMPANY

By ..... PRESIDENT

By ..... SECRETARY

These were sent out to our member companies and the response has been very generous and suggests that the association is proceeding along a line that is of great interest ot its members, subscriptions having already come in from Alabama, Florida, Illinois, Indiana, Kansas, Minnesota, Montana, North Carolina, Oklahoma, Pennsylvania, Texas, Utah, Washington and Wisconsin. Independent telephone companies, everywhere, regardless of whether they are members of the association or not, are invited to participate in this action, if they are interested in getting what belongs to them, that the laws of our land have provided for them should, we believe, assist in this most important action undertaken in recent years.

In fact, even though an Independent company may today have contract relations with the Bell companies, still we believe it is to its interest to join this

action. For this reason: it must be plain to anyone who has observed the general tendency of things, especially during the past three or four years, that the Bell companies have not changed their old time purpose in the least; that they are planning and using every available resource to realize their purpose, which is absolutely to control and dominate the entire telephone situation. In fact we believe, if the Independent telephone companies are going to remain in the telephone business, that they have a fight ahead of them, and that it is true that the Bell companies fear Independent telephone organization; for, if the Independent companies would stand together as a whole, co-operating in every possible way, financially and otherwise, our success would be easy. They, however, will strive to discourage any effective organization and the methods which they will pursue in doing it are such as to be not easily discerned. Their agents will approach Independent operators and suggest past friendship and the excellent service which they are furnishing, etc. And in doing this they will not refer to the earlier days when they used to burn Independent telephone switchboards in the public squares, or if the Independent purchases supplies or apparatus from the Western Electric Company, which is only a part of the Bell Company, their agents will offer smooth stories along the same lines, but fail to tell you that they take the profits from these purchases to put connecting Independent telephone companies out of business; or how, prior to just a few years ago, they would not sell any of their equipment or supplies under any consideration to Independent companies.

This is distinctly the time, and the opportunity is now offered as never before, for every Independent telephone company to get solidly behind this action of the Independent Telephone Association of America and see that it is supplied with plenty of money with which to take this matter before the Interstate Commerce Commission and before the highest tribunal of the land, if necessary, so that we can find out, once for all, what our position is.

The California Convention

During the summer months it was thought inadvisable to make any special effort towards securing reservations for the California convention, although reservations were received from time to time. Now, however, that vacation days are practically over, Secretary Vivian announces that activity will be resumed and from now on until the convention time, every effort will be made to develop interest and secure a large attendance. Every indication points a large attendance at this convention in California, which will be the first time in the history of Independent telephony that a convention of national character is taken to the Pacific coast.

The California Independent Telephone Association has already decided to hold its convention at the same time and place.

The Rock Island Lines is preparing an itinerary booklet, which will be ready for distribution within a few days, and will be sent out generally to the Independent telephone operators.

The Independent Telephone Association of America realizes that this is an exceptional opportunity for Independent telephone men to cross the continent to attend this convention, because of the International Panama-Pacific Exposition and the California Panama-Pacific Exposition at San Diego. This means that Independent telephone men can enjoy the convention, see both expositions and see the country over which they will travel. This is the first time and perhaps will be the last time the same opportunities will be offered in crossing the continent.

By the last of September the program will be practically completed, so that in the next issue of TELEPHONE ENGINEER a complete program will appear.

All who contemplate taking advantage of this trip should get into communication with Secretary Vivian of the association and make reservations at once.

The following is what the trip will include outside of the convention itself:

First-class railroad transportation to San Francisco, good for 90 days stop-over.

Transportation to Los Angeles and San Diego and return.

Pullman standard sleeper to San Francisco, giving entire section to two persons, except by request or consent. If two persons occupy one berth a reduction of ten dollars is made on the two tours.

Transfer of member and chcked baggage to and from hotel at San Francisco.

Seven consecutive days at Hotel Plaza in San Francisco (only two in double room), including seven breakfasts. Seventy-five per cent of rooms with private bath, those making first reservations having first choice.

Seven admissions to Panama-Pacific Exposition.

Admission to twenty attractions within Exposition Grounds.

Trip to Mt. Tamalpais (8 hours) on the "Crookedest Railroad in the World."

Steamer trip (4 hours) San Francisco Bay, viewing Golden Gate and Exposition Grounds.

Key Trolley trip (7 hours) through Oakland, Alameda and Berkeley, visiting the University of California, famous Greek Theater and Idora Park.

Chinatown trip with guide.

One day, room with bath, Hotel Roslyn, at Los Angeles.

One day, room with bath, Hotel San Diego, at San Diego.

The total expense of this tour as outlined will amount to $141.00 from Chicago. An additional charge will be made for Drawing Rooms on Pullman. Each reservation must be accompanied by a deposit of $10.00, and $10.00 additional in 30 days; balance to be paid on or before October 11, 1915.

Make all checks payable to W. S. Vivian, Secretary, Independent Telephone Association of America.

Commission Calls Conference

The Interstate Commerce Commission calls a conference with the joint committee for 10:00 a. m., September 8, 1915. This conference committee consists of H. Linton Reber of the Independent Telephone Association of America, Leroy Parker of Columbus, Ohio, representing the National Independent Telephone Association, and a third from the Bell Company.

If there are any matters pertaining to the accounting requirements as prescribed by the Interstate Commerce Commission, it is suggested that you write Secretary Vivian of the Independent Telephone Association of America, who will see that it is presented to the joint committee, so it can be mentioned to the commission.

From the Association News, published by the Independent Telephone Association of America, issue of July 15, 1915:

This is the last issue of Association News in this form. Hereafter it will be included with TELEPHONE ENGINEER. In the future TELEPHONE ENGINEER will be received by all members of the Association as a part of the Association benefits. We trust all of our readers will be pleased and benefited by this change. You will find announcements, notices and articles pertaining to the Association work in future issues of TELEPHONE ENGINEER.

CALIFORNIA

San Francisco (Cal.) Examiner, August 10, 1915.

City Attacks Four Public Utility Rates

Representatives of the city of San Francisco yesterday filed four complaints with the State Railroad Commission against public utility corporations in San Francisco. Excessive rates for public utilities are alleged.

Complaint was lodged against water, telephone, gas and electric charges.

San Francisco (Cal.) Examiner, August 17, 1915

Light, Telephone and Water Cash Deposit Plan Dead

The system of advance deposits exacted from consumers by gas, water, telephone and electric companies received a rude shaking up at the hands of the state railroad commission yesterday.

What Decision Means

Following are the principal points of the decision:

Henceforth no deposits need be paid by persons taking flat-rate service from water, gas, electric or telephone utilities if the applicants own the property or can secure a responsible guarantor or have paid their bills promptly during the last year.

The $5 deposit charge is abolished. Henceforth residence or domestic consumers paying a deposit will not be called upon to pay in excess of $2.50.

Water, gas, electric and telephone utilities can no longer discontinue service for failure to pay a back bill, but may protect themselves by demanding deposits as payment in advance if back bills are not paid.

Service henceforth cannot be disconnected until after reasonable notice of intention to do so.

COLORADO

Denver (Colo.) News, July 27, 1915

Ouster Filed by Rush

District Attorney John Rush yesterday filed with the State Supreme Court his brief in the ouster suit against the Mountain States Telephone & Telegraph Company, in which District Judge Denison ordered the company to vacate the streets of Denver. There are 500 cases cited in the brief and 1,000 alluded to. After oral arguments are made in the case the tribunal will take it under advisement. An announcement of a decision is not probable before November.

FLORIDA

Tampa (Fla.) Tribune, July 30, 1915

Free City Telephones Must Be Discontinued

Application has been made in Circuit Court here in behalf of the state of Florida for an injunction against the Peninsular Telephone Company restraining that company from giving the city of Tampa the use of twenty free telephones and thirteen other phones at special rates, as is being done according to an agreement specified in the company's charter, on the ground that this constitutes a discrimination against other telephone users. The court is also asked to restrain the company from granting free service to eight churches and charitable institutions and special rates to thirty ministers.

GEORGIA

Augusta (Ga.) Chronicle, July 24, 1915

Postal Long Distance Telephone Service

The Augusta office of the Postal Telegraph Company now has its long distance telephone service installed with connection established with five or six important cities, and the service will be extended just as rapidly as the necessary equipment can be put into operation. The connection with Atlanta was perfect, and the conversation as satisfactory as though it had been a face-to-face transaction.

ILLINOIS

Aurora (Ill.) News, July 9, 1915

Inter-State Telephone Company Protests

Claiming that the Inter-State Telephone & Telegraph Company is assessed too high in 15 Will county townships, H. E. Jeffery, special agent for the company, has filed a request for a revaluation of all its property.

Back of the request is claimed to be the condition of the country lines, which were hard hit during the snow and sleet storm of some two years ago, damaging the lines greatly.

Want Sweeping Reduction

The request covers a reduction of from $900 to $13,000 in each instance. "We consider that the assessor's valuation in these townships has been excessive for a number of years," said Mr. Jeffery. "We feel certain that the values placed by us are fair. They are the same for the same class of property that we have given in every township throughout the state in which we operate. We are operating in 150 townships in 21 counties, and there are 24 townships, located in only four counties, in which we are asking a reduction; fifteen of them are in Will county."

Company Gives Figures

Following are the towns, valuations proposed by the company, and the values already fixed by the assessors:

Town	Company Valuation	Assesors' Cash Valuation
Plainfield	$ 2,671	$ 5,790
Troy	494	1,458
Channahon	366	1,260
DuPage	1,061	5,070
Lockport	2,636	10,200
Joliet	34,237	47,985
Wesley	902	3,645
Homer	756	2,325
New Lenox	574	1,470
Frankfort	1,727	10,815
Peotone	2,426	7,200
Monee	1,137	3,150
Will	664	1,914
Crete	1,690	4,980
Green Garden	1,190	3,660

Springfield (Ill.) News, July 23, 1915

Must Give Him Telephone Service

In an order entered by the state public utilities commission, today, the Illiopolis and Christian County Telephone Company is required to give service to E. F. Colwell, who resides in Mosquito township, Christian county. Colwell has a private line leading from the company's line, and he refused to make improvements on this line which the company thought he ought to make. It cut off his service until he would make the improvements. The commission orders it to resume service.

Bloomington (Ill.) Pantagraph, August 2, 1915

Clinton, Aug. 1.—(Special.)—The National Telephone & Electric Company of Clinton, owned principally and almost entirely by the Wasson brothers, B. F., of Clinton, and V. R., of Decatur, was sold to C. B. Cheadle, of Joliet, and E. B. Sterrett, of Henry, Ill., by a deal completed in Decatur Saturday morning. The formal transfer of the stock was made Saturday afternoon.

Price $130,000

The price paid for the Clinton company is not given but it is said to be right at $130,000, part of this being the assuming of $90,000 indebtedness of the company on the part of the purchasers. The Clinton company not only includes a telephone system in Clinton but also exchanges in Farmer City, Mansfield, Weldon, Waynesville and Kenney, comprising over 3,000 subscribers.

Bloomington (Ill.) Bulletin, August 3, 1915

Kinlock to Make Big Improvements

Petitions of the Kinloch Long Distance Telephone Company to issue 5 per cent first gold mortgage bonds to the extent of $641,000 and for authority to issue $527,000 of its common stock will be heard by the state public utilities commission on August 4. This is not the local company.

This money will be expended in reconstruction of long distance lines throughout Illinois. In particular there is considerable work to be done on the Terre Haute-St. Louis lines of the company.

Quincy (Ill.) Journal, August 3, 1915

Telephone Companies Divide Territory

Macomb, Ill., Aug. 3.—The Western Illinois Telephone Company, with headquarters in this city, and the Mississippi Valley Telephone Company, with headquarters in Carthage, have divided the territory wherein they were competing so that in the future they will co-operate.

The Western company gets the south tier of townships in Hancock county and the adjoining ones in Adams. It also gets exclusive exchanges in Bowen and Loraine.

The Mississippi Valley Company gets the balance of Hancock county and exclusive exchanges in Carthage and Hamilton. In each of the four towns mentioned there have been two exchanges, one owned by each company, in the past, but now there will be one only in each city.

The Western gets connections with the McClintock Farmers' Exchange at Denver and the Mississippi Valley secures connections with the Farmers' exchange at Stillwell. Connections between the two systems are established at Bowen and Sutton and an agreement has been made for the exchange of service.

Rushville (Ill.) Times, August 5, 1915

'Phone Company Reorganized

The Schuyler Telephone Company, which maintains the local exchange in Rushville and controls practically all the country lines which enter this office, has lately been reorganized, and J. E. Peck now owns a majority share of the stock.

Mr. Peck was the largest stockholder in the company, with 334 shares, and by purchase acquired 357 additional shares, which gives him a total of 691 shares. The following sales of stock were made to Mr. Peck: C. L. DeWitt, 256; Perry Logsdon, 76; J. W. Whitson, 3; John Lambert, 15; D. F. Turner, 8; George Naught, 5; E. A. Hodges, 4.

The Grange Telephone Company has also sold its lines and franchise to the Schuyler Company, and the transfer has been approved by the state public utility commission. Negotiations are under way to acquire two lines from Rushville to Camden, owned by Mose Weinberg, and the remnant of the old Western Illinois system, and this will consolidate the telephone business of the county in one company. It is proposed to increase the capital stock of the Schuyler Telephone Company, from $10,000 to $18,500, as improvements are planned that will call for an additional outlay for equipment.

Under this arrangement the Schuyler Telephone Company will have a monopoly of the county telephone business, and this is the ideal condition for good telephone service, and Mr. Peck proposes to make improvements that will give Rushville and the country patrons the best service possible. He has retained L. M. Sparks as general manager of the company.

Chicago (Ill.) Tribune, August 6, 1915

Noble Mutual Telephone Company, Noble; capital, $2,500; incorporators, H. F. Diel, Webster Hanna, R. S. Hanna.

Chicago (Ill.) Herald, August 17, 1915

The Ohio State Telephone Company reports total earnings of $2,877,353 for the year ended June 30, the first year of its existence. Net earnings were $579,244 and the balance after preferred dividends, $287,837.

Chicago (Ill.) American, August 6, 1915

Chicago Tunnel Company Asks Tax Cut

The Chicago Tunnel Company, which took over the properties of the Illinois Tunnel Company, is operating its transportation business at a loss because of excessive taxation, according to a complaint filed with the board of review today by S. W. Tracy, vice-president.

The complaint was against the valuation made by the board of assessors of $7,000,000, an increase of $4,000,000 over last year's valuation. The tunnels have been assessed at the following valuations:

1907	$1,800,000	1911	$6,000,000
1908	3,000,000	1912	4,000,000
1909	3,000,000	1913	3,650,000
1909	3,000,000	1914	3,000,000
1910	3,000,000		

During the past five years the amount paid in taxes, in excess of the earning of the company, was $134,476.05, Mr. Tracy said. The net earnings of the company for the past five years was $393,559.15, and the taxes and the city franchise cost $528,035.20.

"Transportation in the tunnel relieves congestion in the streets of the loop," said Mr. Tracq. "The business handled through the tunnels during the year 1914, if handled on the surface, would have resulted in an average daily movement of 5,488 wagons in the congested area of the city. This shows the company is performing a real service without, however, realizing any profit."

INDIANA

Logansport (Ind.) Tribune, August 1, 1915

Says Rates Have Been Too Low; Raise Oct. 1

The Public Service Commission of Indiana rendered a verdict at Indianapolis yesterday on the petition of the Logansport Home Telephone Company for a raise in the rates here. The increase in rates petitioned for was granted to the local company, but only for the telephones in the city limits and the raise does not apply to rural route telephones or branch exchanges. The raise in rates goes into effect October 1, 1915.

The Public Service Commission being duly advised in the premises finds from the evidence in the case that it would cost approximately $95 per station to build the Logansport Home Telephone system and bring it to the present state of efficiency.

The Public Service Commission further finds that the evidence in the case and from the experts of the said commission that the present telephone system in the city of Logansport is in eighty per cent condition of efficiency.

The Public Service Commission further finds that the value of the Logansport Home Tele-

phone Company upon which said company shall be allowed to earn is $75 per station.

The Public Service Commission further finds that on April 1, 1915, the Logansport Home Telephone Company had 3,485 stations in Logansport.

Valued at $261,375

The Public Service Commission further finds that the value of the Logansport Home Telephone Company is $261,375. The going value of the Logansport Home Telephone Company's plant is included in the above amount, and was determined upon the evidence in the case, based upon the amount of money that it would require to build and install the telephone plant in the city of Logansport, and bring it to its present state of efficiency.

The Public Service Commission further finds that the following rates, tolls and charges will yield the Logansport Home Telephone Company an average of $23 per year per station, after the company has had sufficient time to give the people of Logansport good and efficient service, and to furnish the kind of service desired by its telephone users:

Business

One-party line	$36 per year
Two-party line	$30 per year
Extension—first	$9 per year
Extension—second	$6 per year
P. B. X.	$10 per year

Residence

One-party line	$24 per year
Two-party line	$21 per year
Four-party line	$15 per year
Extension	$6 per year

It is further ordered by the Public Service Commission that the Logansport Home Telephone Company set aside and keep as a depreciation fund four per cent on $75 for each and every station now in use and for any others that may be hereafter installed.

Indianapolis (Ind.) News, August 16, 1915

Articles of Incorporation

Boone Township Telephone Company, Madison county, has increased its stock to $1,000.

KANSAS

Topeka (Kan.) Capital, July 29, 1915

Close Leaves Commission Joins Telephone Ass'n

Dr. J. H. Close, assistant secretary of the Kansas Public Utilities Commission, has resigned his position to become secretary of the Independent Telephone Association September 1. He will succeed Fred Coulson, who has been transferred to Abilene as commercial superintendent of a score of Independent exchanges in Saline, Dickinson, and Mitchell counties. Dr. Close will be succeeded as assistant secretary of the commission by Malcolm Gray, a prominent young lawyer of Leavenworth.

Salina (Kan.) Journal, August 5, 1915

Telephone Equipment at Ford

Ford, Aug. 5.—The Ford Mutual Telephone Company has ordered a new 100-drop switchboard from the Kellogg Company. The new board is the best equipment that can be furnished for offices of this class, and is to be here in about two weeks. Considerable other improvement will soon be made in the way of new poles and cross-arms, all of which will tend to the betterment of the service.

Topeka (Kan.) Capital, August 8, 1915

Telephones Pay Better Returns Than Railroads

Taken as a whole, the telephone business in Kansas seems to be a better paying proposition than the railroad business. At least it shows up this way on the face of the returns of these classes of utilities to the Kansas Public Utilities Commission for the fiscal year 1914, the latest on which there are any comparative reports compiled.

The utilities' statements, based on the reports of the railroads and telephone companies to the commission, show that while the total operating revenues of the railroads were larger by nearly fourteen millions of dollars than the telephone revenues, the operating expenses of the railroads were more than thirty-six million dollars larger than those of all the telephone companies in the state. And the net operating revenues of the telephone companies, according to their reports, were more than twice as large as the net operating revenues of the railroads.

The operating revenues of the railroads in Kansas for 1914 are shown to have been $71,606,628.33. The operating revenue of the telephone companies totaled $57,701,145.77.

The operating expenses of the railroads are reported to have been $49,982,860. The telephone companies reported a total operating expense of $13,856,332.58.

The net operating revenue of the railroads in Kansas for 1914 is reported as $21,623,768.33. On the other hand, the telephone companies report a net operating revenue of $43,844,813.19.

More than this, the telephone companies apparently have the edge on the railroads in the matter of dividends declared during the year. The telephone companies operating in Kansas reported dividends paid during the year totaling $27,983,418.26. The railroads operating in Kansas reported dividends paid—entire lines—during the year of $15,166,797.38. The telephone company reports include the Kansas City, Mo., business, by the way.

KENTUCKY

Louisville (Ky.) Courier-Journal, July 25, 1915

Brewers Telephone Company, Brewers; capital $350; incorporators: A. J. Bean, J. C. Chester, T. W. Lyles, L. P. Tyree and S. S. Kisney.

MICHIGAN

Grand Rapids (Mich.) News, July 17, 1915

C. E. Tarte has been re-elected president of the Battle Creek Citizens Telephone Company, and A. E. Well, secretary. R. D. Graham and John B. Martin, also of this city, are directors of the company.

Grand Rapids (Mich.) Herald, July 19, 1915

Muskegon Telephone Exchange Putting Up New Building

Muskegon, Mich., July 18.—Work on the new exchange building of the United Home Telephone Company on Terrace street, near Clay avenue, is now going forward rapidly, the entire structure being almost half completed at the present time. The brick work is now finished to over one story in height. The new exchange building will be one of the finest of its kind in this part of the state, and will be completed about September 1. The structure measures 40x70 feet and the cost of construction will be almost $20,000. All of the windows have steel frames and will be fitted with wire glass. By October 1 it is expected the new automatic telephone system will be installed and in operation.

Thus far the United Home Company has expended well over $100,000 in making its local equipment one of the most modern in the entire country, and before the system is in full operation nearly double that sum will have been expended. The system is practically a duplicate of that now used by the Citizens company in Grand Rapids, although the instruments are of a more recent type. The United Home is making the improvement in the face of the announcement by the Bell interests that they are to build a $250,000 central building and equipment for this city in the near future.

Grand Rapids (Mich.) Press, July 24, 1915

Of the total number of telephone instruments in use throughout the world North America has approximately two-thirds. The total number is 14,888,550 and in North America alone the total is 10,120,948. Europe has only 4,012,709; Asia, 306,085; Africa, 65,096 and Oceanica, 217,381.

In North America there are 7.5 instruments to every 100 of population. Europe has eight-tenths of one instrument to each 100 population; South America has three-hundredths of one telephone to the 100; Asia, four-hundredths; Africa, five-hundredths, and Oceanica, five-hundredths.

The total shows nine-hundredths to each 100 of population for the whole world and the showing of America with better than seven shows how far it is ahead in the matter of telephony.

Detroit (Mich.) Times, August 4, 1915

Meter Plan Great for Telephone Co.

Whether a metered system will benefit Detroit's telephone service by cutting down the number of calls is questionable, but one thng is certain, and that is, if the application of the telephone company is granted by the state commission, the revenue from telephone subscribers will be greatly increased.

A preliminary investigation and a comparison of figures has satisfied Corporation Counsel Dingeman that the annual increase in revenue to be derived from metered service, even the so-called modified form, would be about $600,000—a 20 per cent increase.

"Plainly, there are two contentions before the state railroad commission," said the corporation counsel. "The people of Detroit want better telephone service, and the telephone company wants more money from its subscribers. We will admit we don't want cheap telephone service, but we want good service—and at reasonable rates."

Grand Rapids (Mich.) Herald, August 6, 1915

Boosts City's Telephone Rate

In a communication to City Clerk Shriver yesterday, to be submitted to the common council, the Citizens Telephone Company announces an advance in rates of its telephones and extensions in use in the various city departments. The total paid by the city heretofore has been $1,228.84 annually, and under the regular schedlue rates the total will be $1,940.50, an increase of $712.66.

According to the terms of the franchise granted the company the city is to have free use of 12 telephones. In addition to these there are in use approximately 77 telephones, 30 of which are main line and 47 extensions.

Saginaw (Mich.) News, August 7, 1915

Birch Run Telephone Co. Names Directors

The Birch Run Telephone company, which has 175 subscribers in one year of business, held a well attended meeting of the stockholders Thursday evening and elected a board of directors from which officers will be named later.

The directors are: C. W. Wohlahan, Miles Hadsell and Edward Helfricht of Birch Run and C. O. Trask, president of the Valley Home Telephone Co., of Saginaw, and Postmaster W. F. Hemmeter of the Saginaw west side office.

Reports received from the managers were that the company is thriving and the prospects for increasing the numbers of subscribers is excellent.

Grand Rapids (Mich.) Press, August 9, 1915

The automatic telephone exchange erected by the United River Plate Telephone Company, in Cordoba, Argentina, has just been opened. This is the first automatic telephone exchange in South America.

Grand Rapids (Mich.) Herald, August 10, 1915

Van Buren Telephone Co. Renamed by Stockholders

South Haven, Mich., Aug. 9.—Stockholders of the Kibbie Telephone Company today changed its name to the Van Buren County Telephone Company. Starting at the hamlet of Kibbie 20 years ago with three subscribers, the lines have gradually been extended into every part of the county with 10 exchanges and 3,000 subscribers, the company has been for some years in fact what it now becomes in name.

Detroit (Mich.) News, August 19, 1915

City Can Make Own Telephone Appraisal

Decisions favorable to the city throughout were given by the state railway commission Wednesday, over objections of the Michigan State Telephone Company, in a discussion of the method of appraising the telephone company's properties. The commission went so far as to agree to permit the city to do the appraising alone, though the state body will have an expert check over the figures. There had been much dispute previously about whether the city or the commission, or both, should conduct the investigation.

Arthur von Schlegell, general manager of the telephone company, objected without avail to taking the company's valuation of July 1, 1915, as a basis for the appraisal to be made by E. P. Burch, the city's expert. The commission, which was represented by Chairman Glasgow and C. B. Hall, refused to sanction the company's proposal that the appraisal be based on the valuation of July 1, 1914, on the basis of which the company filed its first petition for permission to install metered service.

MINNESOTA

Duluth (Minn.) News-Tribune, July 9, 1915

Blackhoof to Have Telephone Lines; New Company is Formed

Carlton, Minn., July 8.—Blackhoof town residents will have a telephone July 25, when the Blackhoof Rural Telephone Company will put its line in operation. At a meeting of farmers at the F. Goad home in Blackhoof township last night, it was decided to start work on the line at once and complete it July 25. There are 15 stockholders in the co-operative enterprize and they will pay 25 cents a month to connect with the Zenith telephone and for the use of the central switchboard at Carlton.

St. Cloud (Minn.) Times, July 10, 1915

Work Started

The development of a competitive telephone system in this city is seen in the growth of the Tri-State Telephone & Telegraph Company's popularity as a transmitter of long distance messages. The latest concrete evidence of this fact is the commencement of work today on the new lines to be built to the Great Northern shops and depots.

Minneapolis (Minn.) News, July 22, 1915

Telephone Consolidation

The state railway and warehouse commission today authorized the first consolidation of telephone companies under the 1915 law. Permission was granted the Fulda Telephone Company to buy 141 miles of line from the Brewster-Brown Lake Telephone Company for $20,000.

Minneapolis (Minn.) Tribune, July 28, 1915

Telephone Rate Is Cut

The Willow Creek Telephone Company has been ordered by the state railroad and warehouse commission to lower the rate from Mankato to Willow Creek from 36 to 26 cents to correspond with the rate the other way. It is the first rate change ordered under the new law.

Winona (Minn.) Independent, July 31, 1915

New Law Won't Force Merger of Telephone Concerns

The railroad and warehouse commission is without power to compel telephone companies in the same town to make physical connections between the two systems, no matter how desirable such an arrangement might be to the citizens. This is the answer of Commissioner Charles E. Elmquist to J. B. Ries of Shakopee, and the ruling is of great importance to telephone users.

No Inter-Town Business

Mr. Elmquist explains that the commission can compel a telephone exchange to connect with a toll line, a toll line to connect with a city exchange and to require two toll lines to join the service when the public convenience or necessity demands and the order will not do irreparable injury to either concern, but two telephone companies in the same city cannot be forced to do business with each other.

Moorhead (Minn.) News, August 5, 1915

Telephone Franchise Is Won

After years of negotiation and litigation, the Minnesota Telephone Company, a subsidiary of the Tri-State Telephone Company, has obtained a franchise to maintain a telephone exchange in Brainerd. The application by the Northwestern Telephone Exchange Company to have the former concern enjoined from operating in Brainerd was denied by the Minnesota railroad and warehouse commission after an all day hearing Saturday.

The Minnesota company rested its case on the fact that it had been granted a franchise by the city council June 12 and had made every effort in the limited time to establish a telephone service by July 1. The commission decided it had no power under the Minette law to interfere with the franchise.

The efforts of the Minnesota company to get a foothold in Brainerd makes interesting telephone history. One franchise was declared invalid by the state supreme court and another was rejected by a referendum vote.

Minneapolis (Minn.) Tribune, August 6, 1915

Tri-State Telephone Co. to Build New Exchange

A three-story brick and concrete telephone exchange building is to be erected at Third avenue and Sixth street south by the Tri-State Telephone & Telegraph Company, according to the building permit issued yesterday by J. G. Houghton, building inspector. The structure is to have a frontage of 120 feet on Third avenue and extend back 66 feet. It will cost $80,000, and will be ready to handle a portion of the downtown business on February 1, 1916.

Minneapolis (Minn.) News, August 10, 1915

New Telephone Law Is Given Initiation

The first application to compel the Northwestern Telephone Company to allow the Tri-State Company to make physical connections through the Bell Company with the farmers' local exchanges, under the law passed by the last legislature, was filed with the state railroad and warehouse commission today.

The city council of Owatonna filed the petition. A resolution adopted by the council states that the people of Owatonna cannot use a toll line out of that city except by going to a pay station.

The Northwestern Telephone Company operates both local and toll lines out of the city. The commission is asked to issue an order to the Northwestern Company to allow the connections to be made.

Company Must Answer

The commission has notified the Northwestern Company of the receipt of the application and that company has 20 days to acknowledge compliance with the order or file an answer setting forth objections to it.

If the company objects the commission will conduct hearings and if it finds that public necessity warrants the connection, it may order them made.

This is the first petition made under the law passed by the last legislature and the outcome will establish a precedent that will affect many other cities and towns in Minnesota.

Minneapolis (Minn.) Tribune, August 17, 1915

Brainerd House Rate to Be Reduced

The state railway and warehouse commission yesterday granted the request of the Northwestern Telephone Exchange Company to be permitted to reduce its residence telephone rates in Brainerd. The company desired to be in a position to meet the rates of the Minnesota Telephone company, a rival.

The rates are reduced from $2 to $1.75 for a direct line and from $1.75 to $1.50 and $1 for a party line. The Minnesota Telephone Company opposed the reduction.

MISSOURI

Joplin (Mo.) Globe, July 9, 1915

English Telephone Service

The fact that the English government owns its telegraph and telephone systems is frequently cited by government ownership advocaters as proof that government ownership is the proper idea. Many figures have been presented showing that it is a losing venture for the government, but the partisans to the idea consider the figures have been juggled. Here is a line on the situation from another angle:

In one district only twelve miles outside of London, in which there are six towns, the largest having a population of 20,000 and the combined population being 45,000, there are only 240 persons with telephone service.

Imagine such a situation in America. In the English district mentioned it should also be stated that only 10 per cent of the 240 telephones represent private houses, the remainder being stores. It seems almost unbelievable that such a great convenience as the telephone could be in only ten homes in a community with a population greater by 10,000 than is claimed by Joplin. Particularly when it is a community only a dozen miles from the largest city in the world.

St. Louis (Mo.) Globe-Democrat, Aug. 1, 1915

Decision Allowing Rate Raise Appealed by Bell

Jefferson City, Mo., July 31.—Although the Public Service Commission held in its recent order that the Southwestern Telephone and Telegraph Company is entitled to charge higher rates in St. Louis than those in effect now, the company is dissatisfied with the ruling and field a motion for a rehearing today, alleging the commission erred on eighteen separate conclusions in its opinions and order.

The motion for rehearing was filed by Frederick W. Lehmann, who has just been engaged in the case.

The company applied for authority to put into effect rates on business phones which it estimated would yield about $157,000 annually in addition to the revenues now received. This amount, it was contended, was necessary to keep up depreciation expenses, meet the increased salaries of operators and pay pensions and benefits to disabled and superannuated employes.

Rates Were Rejected

These rates were rejected by the commission as unreasonably high, but authority was granted to put into effect higher rates than existing ones, which were found to be nonremunerative.

In reaching its conclusions the commission, through Commissioner Kennish, who prepared the opinion and order, disallowed as a necessary item of expense the 4½ per cent of gross earnings paid quarterly to the American Telegraph and Telephone Company, which renders certain official services and lends the use of its patented devices to the Bell Company. Kennish held that the company should own its instruments, and that the engineering and official expenses paid to the American Telephone and Telegraph Company were an unnecessary burden upon the Bell Company.

Issue also is taken with the commission's ruling that 6½ per cent is an adequate return on its investment in St. Louis. Owing to the contingencies and vicissitudes which surround the telephone company, Lehmann holds this is too small a return.

Property Undervalued

For the purpose of ratemaking the commission put too low a value upon the property, the motion alleges. The commission found the value to be $8,500,000, while the company contends it is worth $10,500,000.

Following, in substance, are the grounds upon which the company asks for a rehearing:

That the commission undervalued the property of the company for the purpose of rates, fixing a valuation of $8,500,000, when the company's property is worth $10,500,000.

Because the commission held the proposed rates excessive, although admitting after disallowing large items of expense, which should have been included, that they would yield but 7.111 per cent.

Because it excluded lands purchased by the company for telephone business.

Because it excluded $48,000 paid out in interest on stock subscriptions.

Excluded "Going Value"

Because the commission excluded "going value" in making its conclusions.

Because the commission excluded buildings and land worth $626,969 in making up its valuation for rate purposes.

Because the lands and buildings were valued at $928,682, when they are worth $1,098,689.

Because the value of aerial construction was underestimated in the sum of $248,262.

Because working capital allowance was shaved down to $180,175, when the actual amount was $315,548.

Because the cost of establishing business was $1,495,626, the commission allowing but $6,000.

Because the value of the service to the user was not taken into account.

Because the property from the standpoint of original cost was undervalued.

Because an error was made in adding $17,638 to the earnings.

Because the payment of 4½ per cent of the gross earnings of the company to the American Telegraph and Telephone Company for services rendered by that company and for the use of its patented devices was disallowed in fixing the value for the purpose of rates.

Because only $300,000 was allowed annually for depreciation, while $435,466, or 5½ per cent, should have been allowed.

Because the commission fixed 6½ per cent as a maximum return upon its investment, which the company may receive, which in view of the vicissitudes of the telephone business is insufficient when the cost of money and of development is considered.

Because the commission disapproved of and disallowed an item for employes' pensions and benefits.

St. Louis (Mo.) Globe-Democrat, August 10, 1915

Bell Company Files Revised Telephone Rate Schedule

A schedule of new telephone rates, effective October 1, providing an increase for big business houses and a decrease for smaller concerns, was filed with the Public Service Commission in Jefferson City last night by the Southwestern Telegraph and Telephone (Bell) Company.

Edwin F. Carter, commercial engineer of the Bell Company, said last night that the new schedule provided for substantial reductions in favor of the small consumer.

For instance, users of the direct business measured telephones of 1,800 calls would pay $78 a year, whereas they formerly paid $72. The smaller users, however, could make 1,200 calls for $60, instead of the present 800 calls, or make 840 calls for $45, instead of the present 600 calls.

The company proposes a rate of $108 a year for direct business unlimited service. Members of the commission expressed objections to this rate, thinking $96 is sufficient. The present rate is $78. The company's proposed increase is $30. The commissioners are willing to allow an increase of $18.

The measured business rates proposed by the company are practically satisfactory to the commission, Chairman Atkinson advised the Bell officials in Jefferson City last night.

The $72 direct measured service is raised to $78 in the proposed rates.

Other rates proposed for direct business measured telephones are: Fifteen hundred calls, $69; 1,200 calls, $60; 840 calls, $45. The present rates are. Eighteen hundred calls, $72; 800 calls, $60; 600 calls, $45.

NEBRASKA

Lincoln (Neb.) Star, August 18, 1915

Allows Rate Increase

The telephone rates at Friend may be raised by the Lincoln Telephone & Telegraph Company, the railway commission issuing an order to that effect Wednesday afternoon, signed by Commissioner Clarke. The company had applied for permission to make the increase. The new rates will be as follows: Business phones, $2.50 per month with an added charge of $1.00 when the service is used by two parties. Residence phones, $1.50 and $1.25 per month. Farm lines, $1.50 per month. The company will also be allowed to make a charge when the lines are carried outside the city limits.

NORTH CAROLINA

Asheville (N. C.) Citizen, July 11, 1915

Franchise Filed at Registrar's Office

At the office of the registrar of deeds yesterday was filed a franchise entered into between the members of the board of aldermen of Weaverville and the Weaverville Electric and Telephone Company, whereby the last-named concern is granted the privilege of conducting an electric and telephone business at Weaverville for a period of thirty years. The franchise carries the provision that the company is entitled to the use of the streets for its posts and is entitled to install other apparatus necessary to the maintenance of the business in which it is engaged.

NEW YORK

New York (N. Y.) Commercial Journal, August 6, 1915

Bought By Bell Telephone

Trenton, N. J., August 5.—The Bell Telephone System purchased the Interstate Telephone Company at a receiver's sale here today for approximately $60,000.

Included in the sale are the subsidiary concerns of the Interstate, with the exception of the Bordentown Telephone Company. The Interstate Company has indebtedness of about $1,500,000.

The sale will have to be confirmed by the Court of Chancery.

OHIO

Marion (O.) Star, July 19, 1915

Telephone Company Elects Its Officials

At the annual meeting of the stockholders of The Marion County Telephone Company at 1:30 o'clock today, the board of directors was re-elected. The board consists of George W. King, J. G. Leffler, J. F. Prendergast, D. R. Crissinger, S. E. Barlow, W. G. Harding, H. B. Hane, F. E. Guthery, F. A. Huber, J. A. Schroeter, A. E. Cheney and A. J. Berry.

The annual statement showed a successful year's operations and a gratifying expansion of business. A small surplus remains after paying the fixed charges and the customary dividend, which amounts to 6 per cent per annum.

Following the stockholders' meeting the directors reorganized by electing the same executive officers. They are G. W. King, president; S. E. Barlow, vice-president; F. E. Guthery, treasurer, and A. J. Berry, secretary and general manager.

OHIO

Toledo (O.) Blade, July 30, 1915

To Reorganize

Sandusky, July 30.—The Sandusky Telephone Company is to be reorganized.

"We must correct the mistake of early promoters who apparently thought a telephone system was better than a gold mine," said John G. Steinkamp, of Elmore, general manager, in making the announcement. "This company, like many others, was overcapitalized. The cost of improvements was enormous. Now it cannot dispose of its securities."

By agreement of the stockholders and bondholders the reorganized company will issue $169,900 of stock and bonds, the amount representing the present actual valuation of the plant. The present capital stock is $179,000. There are $179,000 of outstanding bonds.

George Feick and John A. Giedemann, both of Sandusky, are president and secretary-treasurer of the company at the present time.

It is hoped that reorganization may be effected within the next 10 days.

Cleveland (O.) Dealer, Aug. 6, 1915

Davis Metallic Rod Packing Co., Chicago Junction, $25,000; L. J. Davis, W. M. Griffin, E. K. McMorris, A. Hastman and L. M. Funtner.

Educational Novelty Co., Dayton, $5,000; William N. Robertson, F. L. Fuller, W. N. Fryer, G. G. Edgewater, F. G. Clements.

Greenwood Social Club, Lockland; Clifford Raymond.

New Home Telephone, Elliott, $1,000, J. M. Beard, G. B. Smith, W. T. Elliott, F. A. Dawson, F. N. Murphy, Martha Davis, John P. Kennard.

New Comerstown Supply Co., New Comerstown, $3,500; M. W. Danford, G. F. Ortt, E. C. Ortt, C. E. Ortt and Frank Jones.

OKLAHOMA

Oklahoma City (Okla.) Times, July 16, 1915

Who Should Pay It?

Taxation of the American Telegraph & Telephone Company is under discussion before the board of equalization. There is in use throughout the state about 160,000 telephone receivers, and the board is endeavoring to ascertain whether the Pioneer Company, which is using the instruments, or the American Company, which owns them,, should be assessed. The tentative assessment of the latter company last year was $212,000. This year it is placed at $500,000, on the basis of ownership of the pattented device.

PENNSYLVANIA

Pittsburgh (Pa.) Gaz.-Times, July 21, 1915

Stock Increase Notices Filed

Harrisburg, July 20.—Notices of increase of stock have been filed as follows:

Mutual Telephone Company, Erie, stock $500,000 to $1,000,000.

Philadelphia (Pa.) No. American, July 21, 1915

Objects to Colwyn Pole Tax

Protest has been made by the Keystone Telephone Company against the tax rate of $1 imposed by Colwyn borough council on poles. The company contends that court decisions show that a rate of 10 or 12 cents per pole is sufficient.

New York (N. Y.) Com.-Bull., July 31, 1915

Telephone Company Changes

Hazelton, Pa., July 30.—Some important changes in the management of the Consolidated Telephone Company of Pennsylvania were announced here today. On account of ill health William B. Given, of New York, resigned as president and H. W. Daron, of this city, retired as secretary. The following officers have been elected: President, Alvan Markle, of Hazelton; chairman board of directors, H. C. Trexler, of Allentown; vice-president, Henry A. Bishop, of Bridgeport, Conn.; secretary and treasurer, C. J. Kirschner, of Hazelton.

The reorganized board of directors includes, besides the officers, the following: L. A. Watres, of Scranton; I. A. Stearns, of Wilesbarre; Leonard Peckitt, of Catasauqua; John Graham, of Newville, Pa.; Murray Gibson, of Philadelphia; George R. Bedford, of Wilkesbarre, and E. M. Young, of Allentown.

Philadelphia (Pa.) Ledger, Aug. 5, 1915

Financial Briefs

At a special meeting of the New England Telegraph and Telephone stockholders an increase was authorized in the capital stock from $50,000,000 to $75,000,000.

Three New York Stock Exchange seats sold for $55,000 each, same as last previous sale.

Chambersburg (Pa.) Public Opinion, Aug. 10, 1915

Want to Buy a Telephone Company?

Public sale of the Cumberland Valley Telephone Company, with all its equipment and assets, will take place Friday, November 5, at 2 o'clock in the afternoon in Harrisburg.

The date was fixed by Judge McCarrell, following the institution of equity proceedings by the Commonwealth Trust Company, trustee, against the company and its receiver, Henry M. Tracey. Prospective purchasers must post a forfeit of $5,000, according to the court's order, and $50,000 is to be the minimum bid.

Philadelphia (Pa.) Ledger), Aug. 13, 1915

The Keystone Telephone Company reports gross earnings for July at $114,204, compared with $111,467 last year. The surplus account shows $28,624, against $28,707. Seven months' gross aggregates $784,825, an increase of $17,110 over last year. Surplus amounted to $209,174, an increase of $3,118 over the corresponding period in 1914.

SOUTH CAROLINA

Columbia (S. C.) State, July 24, 1915

New Telephone Company

The secretary of state has issued a commission to the St. John's Telephone Company of Monck's Corner with a capital of $1,000. The petitioners are J. R. Williams and W. K. Fishburne.

SOUTH DAKOTA

Aberdeen (S. D.) News, July 10, 1915

The Custer County Telephone Company, Custer, capital $25,000. Incorporators, Frank N. Sutherland, Peter Ziemeet, Arthur Montgomery.

Aberdeen (S. D.) American, July 22, 1915

The Salem Telephone Co., capital stock $3,500. Incorporators, Fred Blankartz, Henry Kolback, Jno. A. Wener and Wm. Westhoff.

Sioux Falls (S. D.) Leader, July 21, 1915

The Daisy Telephone Company, Salem, capital $35,000. Incorporators, Louis D. Rice, Fred Blenkartz, Henry Kolback, John A. Wenner, William Westkoff.

Sioux Falls (S. D.) Leader, July 12, 1915

The Custer County Telephone Company, Custer, capital $25,000. Incorporators, Frank N. Sutherland, Peter Ziemeet, Arthur Montgomery.

Sioux Falls (S. D.) Press, Aug. 18, 1915

Roslyn Will Have Telephone System

Roslyn, S. D., Aug. 17.—Special—This section of the state is soon to have a telephone system, the Roslyn Mutual Telephone Company having been organized and incorporated with an authorized capital of $10,000. The following officers have been elected: President, S. J. Reed; vice-president, H. O. Gilbertson; secretary, O. O. Floren; treasurer, J. M. Holter; additional directors, K. E. Strand, A. O. Hagen.

TENNESSEE

Memphis (Tenn.) Com. App., July 11, 1915

Buying Suggestions

The southern group of the Bell telephone system, which consists of the Southern Bell and Cumberland telephone companies, has adopted a unique plan to reward its employes who make useful suggestions to be applied by the company in its operation. The purpose of this plan is to encourage the members of the organization to submit constructive suggestions about any feature of the telephone business tending to the improvement of the company's men, methods or material.

Under this plan members of the organization who make suggestions which, if put into practice, result in economy of time, effort or material or improved service, will be honorably mentioned in the company's paper and will also receive cash awards in accordance with the provisions of the plan.

Nashville (Tenn.) Banner, Aug. 6, 1915

Telephone Company Granted a Charter

Secretary of State R. R. Sneed has issued a charter to the Christiana Telephone Company. The concern has a capital of $1,000, and the incorporators are H. H. Clark, A. M. Miller, N. D. Ellis, W. T. Gentry and G. W. Smotherman.

Knoxville (Tenn.) Sentinel, Aug. 13, 1915

Modern Telephone System Secured for Whitesburg

Whitesburg, Aug. 13.—The Whitesburg Telephone Company has been organized with M. A. Creech as president. Work is starting on the telephone system of about fifty 'phones which will be installed in this town. These telephones will have free exchange with about 765 telephones outside of the town and connection with the long distance lines. Several pay stations will be installed in the business district. The local switchboard will be operated by Mrs. Nellie Bush and assistants.

TEXAS

Galveston (Tex.) News, July 11, 1915

Home Telephone Company Plans to Enter Field Around Ozona

Ozona, Tex., July 10.—The new telephone company's office is now under construction, and as soon as the material arrives a telephone line will be constructed. This is a home company, capitalized at $20,000, and is expected to extend the line to Sonora, Bonhart, Eldorado, Sheffield and all surrounding ranches. This will make two telephone systems for Ozona.

Dallas (Tex.) Despatch, Aug. 19, 1915

Ford Making Power to Run Bell Telephones

Telephone service is being maintained at the Bell exchange in Galveston by means of a Ford automobile, which is operating a makeshift power plant to supply current for the city wires.

This is the first word that the Southwestern Co. received when the circuits were opened this morning.

There was eight feet of water in the Telephone building in Galveston yesterday. Two thousand subscribers' telephones are damaged by water.

VIRGINIA

Norfolk (Va.) Pilot, Aug. 11, 1915

Oak Ridge Telephone Company, Oak Ridge, Va. Maximum, $5,000; minimum, $2,000; par value, $100. Build and operate a telephone line. C. H. Yates, president; R. B. Carruthers, secretary and treasurer; both of Oak Ridge, Va.

WISCONSIN

Milwaukee (Wis.) News, Aug. 9, 1915

Rate Problems Pass to State Ry. Board

Control of the rate fixing functions of the board of public utilities, with power to fix rates for gas, telephone, water, power, light, and transportation on street railways, will pass to the state railroad commission tonight at midnight.

This is effected by the new state law governing the fixing of rates for public utilities in all cities in the state, adopted by the people at the last state election.

With the new law, there comes to the commission an additional appropriation of $100,000 a year for the extra work entailed.

Madison (Wis.) Journal, Aug. 17, 1915

Thorp Telephone Company, Thorp; capital, $25,000; incorporators, M. Lund, L. A. Lund, C. A. Lund, J. E. Lund, V. M. Lund.

A Tribute to Pupin

One other invention has done almost as much as the switchboard in extending the telephone, says *McClure's Magazine*. This has had as romantic a life as its discoverer. The newspapers today are filled with the fiery excoriations of a distinguished Servian patriot—Michael I. Pupin. Most newspaper readers know this man only as the honorary consul of Servia at New York, as the supposed instigator of plots against the Hapsburg dynasty, as one of the numerous exiles whose appearance on Austrian soil would unquestionably mean his immediate arrest. Michael Idvorsky Pupin splendidly illustrates what American opportunities can do for a European immigrant. In his early days Mr. Pupin obtained employment as a rubber in a Turkish bath. But the American educational system transferred him. He was graduated from Columbia in 1883 and afterward studied extensively in Germany.

The new subject of electro-mechanics absorbed him. One thing had prevented the extension of the telephone; that was, the size of the wire. Long distance lines, up to 1900, demanded wire about an eighth of an inch thick—as thick as a fair sized lead pencil. The New York-Chicago line, built in 1893, consumed 870,000 pounds of copper wire of this size. The enormous expense stood in the way of any extended development. The same thickness also interfered with cable extension. Wires placed under the ground lose an enormous amount of their energy. In the early cables, therefore, the underground wires had to be very thick. Only about a hundred wires could be squeezed into one cable, against the eighteen hundred now compressed in the same area.

About 1900 telephone progress was marking time, awaiting the arrival of a thin wire that would do the work of a thick one. The importance of the problem is shown by the fact that one-fourth of all the capital invested in the telephone has been spent in copper. Professor Pupin, by solving this problem in his quiet laboratory at Columbia university, won the greatest prize in modern telephonic art.

His researches resulted in the famous "Pupin coil," in the expedient known as "loading." When the scientists attempt to explain this they have to use all kinds of mathematical formulas and curves—in fact, they usually get to quarreling among themselves over the points involved. What Professor Pupin has apparently done has been to free the wire from those miscellaneous disturbances known as "induction."

All kinds of influences are warring upon the electric current to deprive it of its strength. Under his system, coils placed at regular intervals along the wires absorb this induction and leave the wire free to do its work. A piece of copper a sixteenth of an inch thick, therefore, does as much as the monster that was formerly required. This invention has resulted in economies that amount to tens of millions of dollars.

Kansas Concerts Over Telephone

The music department of the Kansas State Normal at Emporia, with the co-operation of the Emporia Telephone Company, has just performed a new feat in the way of community service. A large horn has been installed in the music studio. This is attached to the telephone wire and when the rural lines have been connected to it, concerts given in the music hall can be enjoyed by several score of rural subscribers of the telephone company.

Investigate Madison State Offices

The investigation of telephonic service to the state capitol offices in Madison, Wis., is said to have shown that there are about three times too many telephones in use by the various departments. Even office boys and clerks have individual telephones, and the finding of bills for more telephones than can be located in the capitol indicate that some state officials are even making the state pay for telephones at their homes.

The railroad commission offices are quoted as ar example for this condition. The commission alone is paying for thirty-five telephones; the state superintendent of public property finds only thirty-one of these, and is still trying to find where the other four are located and why the state is paying for them. In this office the office boy has a telephone. At desks of the flat top, two-side variety, where two employes work face to face at opposite sides of one big desk, each employe is provided with a separate telephone.

Alleged grafting has been uncovered and will result in suits for reimbursement to the state or on criminal grounds.

Telephone Supplies in Brazilian Cities

Pernambuco will soon be one of the best fields for the sale of telephone supplies in South America.

In October of 1914 the Pernambuco Tramways and Power Company (Ltd.) bought the telephone system from a Brazilian company. The system will have to be rebuilt from the switchboard to the subscriber.

The present plant is the ground return system, with 800 telephones, mostly from Sweden, though a few are from England and France, a switchboard from Germany, iron poles from England, and wire from the United States. It will require a 1,200-drop board, 1,000 telephones, 2,000 iron poles, about 10 miles of cable, and several tons of wire to reconstruct the system. The general manager of the Pernambuco Tramway and Power Company, an American (name obtained from the Bureau of Foreign and Domestic Commerce and its branches) will have charge of the rebuilding, and it would be advisable for companies which intend to tender on the material to communicate with him after April 1, 1915. By that time he will probably be in position to give some definite idea as to what the plans will be. It is to be hoped that firms tendering bids will be careful to quote on just what the manager wishes, rather than attempt to supply other goods as has happened in the case of other cities.

Ohio Demands Universal Connection

Universal physical connection between all competing telephone companies in Ohio is proposed in a recent bill. The measure will break down the barrier that now exists between the users of rival telephone switchboards by compelling the companies to interchange service upon the demand of the subscriber. The provisions of the bill would allow a small fee to be charged against the telephone patron asking connection with the subscriber of another telephone service, but this fee would be subject to the regulation of the state public utilities. If the rival companies could not agree upon the fee, subject to the approval of the commission, then the commission itself would fix the amount of the charge. The proposed law is the most sweeping in the history of telephone legislation in Ohio.

The Automatic and the Yellow Cab

How a Chicago Taxi Company Keeps Its Rates Down by Using Its Automatic Telephones

BY B. E. WOLFF

THE best possible service at the lowest practical price: These are the two aims of the Yellow Cab Company, which began operating a taxicab business in the city of Chicago some two months ago. This enterprise was established by a group of men who for the past eight years have operated the well known Walden W. Shaw Taxi Cab Company, which has enjoyed a very large success in Chicago; but the two concerns are entirely distinct, not only as to operation, but also to policy.

A careful analysis of their business convinced the officials of the Walden W. Shaw Company that their patrons were actuated by two motives. On the one hand was the desire for convenience, on the other the efficiency that can come only from the use of the taxicab.

In catering primarily to the first demand, that of convenience, the Shaw Company has established an elaborate credit department, handling the accounts of its patrons with a minimum of effort to them, and it also maintains a system of cab stands with starters in attendance so that at practically every point where taxi traffic of this class is likely to originate, all the patron has to do is to step into a waiting cab. But these facilities, essential in a service whose keynote is convenience, are costly, and the charges thus necessitated tend to limit the use of taxi service by those who need it because of its efficiency. It was to cater to this patronage that the Yellow Cab Company was organized and its vehicles put in operation.

Yellow Cab Chauffeur Calling Up His Dispatcher at Headquarters for Orders Over One of the Company's Own Automatic Telephones.

In the conduct of a business such as this the utmost efficiency is imperative. To rob the service of its essential excellence would be fatal. The only course was to operate in such a way that the least possible waste of staff and equipment should result. To accomplish this, three measures were taken, which are to a degree, unique in the taxicab business.

In the first place the Yellow Cab Company decided to operate strictly on a cash basis, extending credit to no one under any circumstances. In the second place in order that the Yellow Cab service should not become "cheap" in an undesirable sense, it was necessary to use equipment of the highest class, not only to keep down maintenance costs, but in order to insure the patrons' safety and comfort.

It was no less essential that the men who were to drive these machines should be of the best type. To attract such men and hold them in its service, the Yellow Cab Company has adopted a profit sharing plan by which the drivers receive 20 per cent of the net profits of the company, distributed every twenty months.

It is obvious, therefore, that the problem of using this staff and equipment with a minimum of waste was imperative, and as the Yellow Cab Company's officials have long realized the close connection between the telephone and the taxi business, it is perfectly natural that they should turn to this means as the best solution of the problem. Just how the technical details were to be handled was not apparent at first, but that question was submitted to the Illinois Telephone and Telegraph Company, after the objects sought were clearly formulated, with the result that the Yellow Cab Company now has a system of dispatching and cab control which for efficiency, economy and flexibility is unequalled anywhere in the world.

The only profitable taxicab is the one which has a passenger in it, and the difficulty faced by the Yellow Cab Company was not to induce patrons to use its service, but to get the car and the passenger together with the least lost motion. To maintain cab stands with starters and the string of idle cars would be costly beyond reason, but it is equally necessary to have cars where they are wanted, when they are wanted.

The Yellow Cab Company has, therefore, established a system of telephones of a weather-proof type, and locked against intrusion. These instruments are located at "strategic" points throughout the city's business district, and the system is now being extended as rapidly as possible through the more outlying points.

Above each station is an electric light and the telephone lines all enter at the dispatcher's board in the company's garage. The operation of the system is very simple, and very effective. When a patron telephones in for a cab the dispatcher receives the order and immediately places calls at all the stations in that region. This causes the lights above the telephones to glow and within a very brief time a driver "cruising" in that vicinity, will see one of the signals. Opening the telephone box with his key he calls the dispatcher and receives his order. As soon as the call is answered at one station, the other lights are extinguished, so that other drivers in the vicinity will not call in unnecessarily.

Having executed one commission, the driver proceeds to the nearest call box and gets in touch with the dispatcher. If there are no orders for his immediate vicinity, the dispatcher either directs him to remain at that point, or tells him to cruise along a certain scheduled route.

In this way long "empty" runs back to the garage are largely avoided, while the dispatcher is usually able to "hail" a cab very near the point where the car is desired, thus enabling the company to fill orders more promptly than by sending cars from the garage.

To say that the Yellow Cab Company is highly pleased with the system is to state its attitude conservatively. That the company's patrons are pleased, even though they do not realize the part the telephone plays in

the service, is evidenced by the very cordial support they have given, but it would be unfair to conclude any account of this system without at least a word of appreciation of the efforts made by the Illinois Telephone and Telegraph Company. Perhaps the problem was difficult, perhaps not, but the important part is that the officials of the company showed a real understanding of our plans, and displayed an enthusiastic interest in doing their share towards carrying out our aim in giving Chicago the best possible taxi service at the lowest possible price.

HOW THE TAXI PROBLEM WAS SOLVED.

By K. W. Fort, Superintendent of Plant, Illinois Telephone & Telegraph Company.

In order to supply the Yellow Cab Company with the combined paging and telephone system which, as specified by it, could be operated from the main office of the cab company without the need of attendants at the various cab stands, the Illinois Telephone & Telegraph Company deemed it best to install a private telephone system and switchboard in the company's main garage, and to locate telephones in all parts of the city, operating over the telephone company's lines. These instruments are so constructed that they can be mounted on the sides of buildings and in doorways and are equipped with apparatus of Automatic Electric Company's manufacture. The telephones are of the wall type, mounted in heavy weather-proof iron boxes provided with a standard spring lock to which each driver has a key.

The various telephones are signaled by means of red signal lights mounted in vapor proof globes located above the instruments so that they can be seen by the cab drivers from the street or cab stand.

When a call for a cab is received at the Yellow Cab Company's garage, the dispatcher on duty at the switchboard signals the telephone nearest the location from which the call comes, by inserting a regular telephone plug and depressing a signaling key which controls a relay that throws current out on the line, lighting the red signal light at the telephone. This light glows until the telephone is answered or the dispatcher takes down the connection.

Should the dispatcher desire to secure several cabs at one time he may signal as many stations at one time as there are cords in the switchboard, and give his orders to the first driver that answers, or to all at the same time.

This service is not only convenient and saves time in paging cabs, but permits the cab drivers to keep in touch with the office at all times without having to go to a public telephone to call the office.

The system is very simple and the apparatus has the advantage of simplicity, especially desirable in this case. In addition, it is very flexible, being capable of indefinite extension at a minimum of cost, by merely adding more stations and extending the dispatcher's board to include the necessary extra jacks and cords.

Minette Bill Causes Rate Increase in Minnesota

On May 1 telephone rates from Staples, Minn., to all points in Minnesota and Iowa were increased as a result of the passage of the Minette bill by the last legislature.

The Northwestern Telephone Company, and other companies of Minnesota are re-arranging their rates in compliance with the provisions of the Minette measure, which went into effect July 1. It places the companies under the immediate supervision of the state railroad and warehouse commission.

Changes in the toll rates already have been made and the commission has received information to that effect. In some places the rates are increased and in others they are decreased.

All other tolls within the state and Iowa have been increased.

Until July 1 the commission had no power over telephone rates and advances were made in toll charges before that time without permission.

Ten Year Litigation Ends

Litigation that had extended over a period of ten years was ended when the city of Paducah, Ky., and the East Tennessee Telephone & Telegraph Company signed an agreement settling the issues involved. The suit of the city of Paducah sought to compel the telephone company to buy a franchise, and had been taken to the United States Supreme Court, which tribunal sent it back on an error. Since then the telephone company intimated it would like to compromise the differences, and the city had not taken any further action.

In the agreement the telephone company agrees to buy a franchise for $500, pay all of the court costs and is not to raise its rates for a period of one year. In the last few years the city had not permitted any of the company's telephones in any of the city departments, including the fire and police departments, which action had been a handicap to the company.

Los Angeles Abandons Proposed Measured

In view of the recent annexation of the San Fernando Valley and Palms districts to Los Angeles, Cal., and because of the approaching assumption of increased rate making powers by the California State Railroad Commission, the board of public utilities has recommended to the city council that its recent proposal looking to measured telephone service rates for business telephones be abandoned. The board presented to the council some time ago a carefully worked out plan for measured rates to take effect January 1.

The utilities board recommends that the rates now being charged by the telephone companies be continued in the city proper and that the rates charged in the San Fernando Valley and Palms district before annexation to Los Angeles also be continued during the coming fiscal year.

Telephones Cut Canadian Telegraph Revenue

While the telephone business of Canada last year expanded in fair volume, telegraph companies reported a decrease, owing to the increasing use of long distance telephones.

The ratio of the 521,144 telephones to the population is one to every fifteen. Only in the United States is the telephone in more widespread use.

The telephone companies for the year 1913-1914 report gross of $17,300,000, the comptroller of statistics of the railways and canal department of Canada announces a gain of $2,250,000 over the previous year. Telegraph companies reported gross earnings of $6,000,000, a decrease of some $112,000.

European Telephone Development

Translations from the Foreign Press and Communications from European Engineers

BY FRED W. SCHOLZ

THE long distance telephone exchange which connects Paris, in normal times, with other cities of France and foreign countries was opened in its improved form in 1913. The equipment comprises 200 long distance switchboards with room enough for growth to 320, and with 25 switchboards or tables for A-operators, each having two operators at a board, with possible extension to 40. Provision has been made so far for 1,000 telephone subscribers, with room for a total of 1,600 lines. At present there are 152 tables in service with 508 actual connections.

Service: There are three kinds of service that are supplied: 1. The call of a Paris subscriber for a long distance call. 2. Call coming in from a long distance line for a Paris subscriber. 3. Call from one long distance circuit to another one. (It may be said here that European telephone service understands under long distance calls not only calls between cities at some distance from each other, but also calls between a city and its outlying districts or suburbs around the central district.)

I. When a subscriber from a Paris exchange is connected to this exchange, the operator of the group to which he is connected connects him with the operator whose duty it is to receive the call wanted, known in French as "Annotatrice," who will make a note of the call asked, will plug the switchboard of the exchange desired and will tell the subscriber the probable duration of time within which he may expect his call. When the turn of the calling subscriber has come, *i. e.*, when his exchange or the city called for has answered, the long distance operator, using the telephone line which the subscriber has called, will call him through an operator called the "intermediate" operator, whose switchboard is at the office from which the original call was issued. It is the duty of this operator to call the subscriber to the telephone and then let the long distance operator connect him with the desired number for which he is waiting.

II. Connection asked by a subscriber with a Paris subscriber. In this case, when the called subscriber has been called to his telephone, the long distance operator, after making connections, will again have the original subscriber notified by the intermediate operator, will be connected to the calling operator and will make all necessary connections and watch the call to its finish.

Fig. 1. The Announcing Operators at the Paris Exchange. At the Far End of the Room is the Wall Chart With Its Three Attendant Operators.

III. Connection between Paris exchanges. All the circuits are connected in multiple at every two tables, but connection is made normally by the use of a key placed at the switchboard where this connection normally ends. If the call comes from a circuit A above that of the circuit B asked for, the operator taking care of A will transfer the call to her colleague who usually serves the B connections. From the moment that this line is open for traffic B makes the connection by the use of the key mentioned before. We will see later on how this key is wired and how service is watched by electric lamp signals. If the call coming from a circuit A is below that of the circuit B asked for, the operator taking care of the former connects herself with an announcing operator, who makes a note of the call as she does for a call coming from long distance.

Announcing Operators: In this exchange the city exchanges are connected direct to the announcing operators, whose switchboards are in the third story of the exchange office building. The following system has been used: The calling telephone line does not terminate at a single announcing operator's position, but is connected in multiple to five other switchboards. Placing a plug in the city jack of a telephone line results in lighting up of the call lamps placed below each of the multiple jacks of this line, as well as at the lamps on the switchboards of those of the operators where the call comes in, if the line were not connected in multiple. The announcing operator uses her answering key and connects herself into the circuit either by plugging a jack under the calling lamp lighted or by using one of the multiple jacks. In each case one or the other of these actions on her part will extinguish all of the lamps belonging to the line calling. At the same time the supervisory lamp of the supervisor will be shunted and light up, announcing to the latter that connection between the calling subscriber and the announcing operator has been made. There are 25 of these announcing switchboards, each having two operators. Each call lamp is connected in multiple at five tables, giving 11 operators the possibility to answer to any one call (10 using the jacks, 1 using the key. Each operator has before her six keys, corresponding to six lines or cords, with which she can answer the call, and 60 jacks with call signals are at her command. A special double wire

cord with listening key and lamp signal is provided at each switchboard. Finally, trunk wires and jacks for connection with the telephone lines that normally terminate at her switchboard, and can be used for information service, are provided for at each table.

Details of Service: In order to save the operators the trouble to look for a free announcing operator by testing the various jacks, busy-service lamps are placed at each switchboard, which show, when lighted up, that certain operators are busy. We have seen that as soon as the announcing operator answers by laying over her calling key or plugging the jack, that all the call lamps are extinguished. When she pulls out the plug or returns the listening key to the original position, she lights all these lamps again. This is a signal to the B-operator to disconnect. The only trouble in this system is that a certain time elapses between the moment that the announcing operator removes her jack and the ultimate disconnecting of the lines. It is therefore necessary to provide the relay *R* with a device which will cut the circuit to the lamps and will substitute for the same a connection across a 500W resistance, when the announcing operator answers, and which would work in such a manner that this relay would not release its armature when the operator disconnects. Fig. 2 shows the wiring dia-

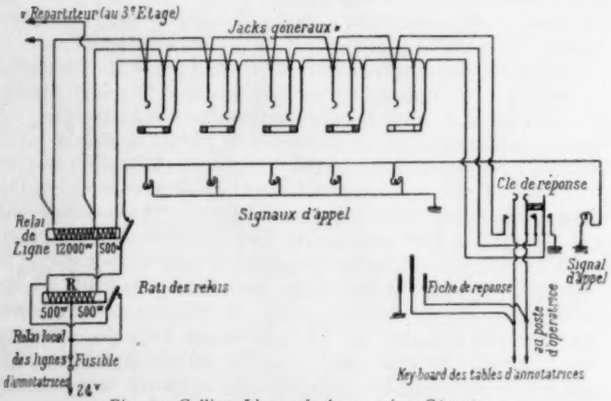


Fig. 2. Calling Lines of Announcing Operators.

gram and how this effect is reached. As soon as the operator at the other exchange has disconnected, the entire line is again in the rest position ready for a new call.

If the announcing operator has to register a call from a subscriber, she fills out a blank with the number asked for and sends it through a pneumatic tube system to the long distance switchboard or the other exchange switchboard, where the connection will be properly made. These cards are of cardboard and have different colors: white for ordinary service; red for inter-office calls; blue for international or government calls; green for information service.

Waiting Time: The announcing operator, before informing the subscriber of the probable length of time he will have to wait, consults a large chart on the wall, visible to the entire room, where the amount of time is indicated that it takes for each suburban, exchange and long distance call. This large chart is tended to by two operators, who have also switchboards, and receive requests from the various operators as to the length of time to be given to the subscribers. The waiting time is returned to these operators by means of four lamps, whose flashes correspond to certain periods of time—in other words, a regular code signal system. The large room shown in Fig. 1 shows the room with the announcing operators at the boards along the two walls of the exchange floor with the large board at the rear wall and the operators in front of it, whose duty it is to announce the time needed for connections to the other operators.

When the announcing operator has filled out the slip for the required number she inserts it in the pneumatic tube service between the switchboards. In pressing a button she sends along the slip through the compressed air system to a sorting table, where operators receive the slips and then send them on by pneumatic service to the switchboards interested and asked for.

The Long Distance (Interurban) Switchboards: Two hundred switchboards have been provided for at present, of which 152 were in service at the beginning of the war. These give service to 508 circuits. These are only wires that lead out of the environments of Paris. The switchboards are provided on the vertical panel field with: five connecting jacks with their call numbers, and one answering jack to answer other operators; five call lamps for day service, five supervisory lamps and one night call lamp; the calling keys for information service and for the night connection; for each circuit jack there is a time register and the corresponding supervisory lamp. Outside of that the panels offer nothing different from any other boards. On the table in front of the operator are eight pairs of cords provided with lamp service to show when connections are to be broken, a calling key, listening key, and automatic call key with device which returns it to rest position mechanically without the aid of the operator. Two pairs of cords are used for communication within the exchange. There are thirty call buttons with room for thirty more, the alternating current calling and ringing device, the pneumatic service, one for every two operators, and an automatic signal lamp, which is lighted when the operator uses the automatic call key and goes out when the subscriber has hung up the receiver.

When the operator uses her answering key she connects her circuit in multiple. The busy lamp is lighted when the line is busy on one side only and when the other side has not answered. The operator who has asked for a call and has plugged a jack in the multiple circuit at her disposal, has been notified of the fact that the line is at her service by the extinguishing of the supervisory lamp of the cord used. When the conversation has finally finished she disconnects, and in this way re-lights the busy lamp of that circuit at the switchboard where the line terminates, in this way indicating to the operator at that switchboard that she can dispose of it for a new call. The wiring diagram for an "interurban" connection is shown in Fig. 3.

For night service or for periods of slight traffic two arrangements can be used. Either all the circuits are connected to 50 tables by means of one key which connects all the circuits in multiple and substitutes for the calling lamp of the day circuit another lamp placed at a special table or switchboard called "night-board," or all the lines are concentrated at 10 tables only. In addition there is placed between every two operators a registering device, which, operated by two levers, prints on a card the toll charges for each long distance conversation and the length of conversation. These slips, similar to an endless band, are in duplicate and are used to render bills to subscribers.

For cables between the terminal boxes and the base-

ment in which the cables end before they lead to the intermediate distributing boards, cables with 14 pairs of conductors were used, using 2 mm. wires. The cost of these cables was $1.40 per meter (42 cents per foot). This was cheaper than using two cables with seven conductor pairs each, which would have cost $1.80 per meter (55 cents per foot). Another reason was the nearness of the cables to the sewers of Paris. Auxiliary lines have also been used, which have been simply encased in ordinary cables of two wires each with an additional third wire for signal service. To test the cables for leakage a compressed air system has been introduced, which gives an automatic signal showing cracks in the cable coverings, even though the insulation has as yet not been laid bare. The cables are laid in special brick conduits on supports, about 50 cables to a conduit, which corresponds to about 7,000 subscribers. At present there are only 3,500 subscribers for whom wires have been laid, but it is thought best to look ahead and avoid expensive reconstruction by arranging for future service.

The supervisory test switchboards have 200 cords with which the various connections can be tested for trouble. The telephone circuits terminate in jacks which connect to a call lamp, which is lighted by calls from the exchange. The lamp is extinguished when the trouble man plugs one of the jacks. The circuit on the side of the subscriber's wire ends in a jack, which, through the pressing of a button, permits an interchange of the two wires of the line. A second button can be pressed and will allow either of the two wires to be grounded. Finally, pressure on a third button will connect the circuit to a visible annunciating disc arranged at the vertical panel of the test board. In the case when the commutation button (No. 2) is not pushed down while the grounding button is pushed down, a 24-volt battery, one of whose terminals is grounded, is connected to the two wires of the telephone line across the annunciating disc.

Finally there is the usual information service to which any subscriber can be connected by the operator by plugging the proper jack. The supervisory switchboards are of the usual type and permit listening to any conversation. The power is furnished by the larger and older central exchange, which has 3,500 subscribers and is able to furnish service cheaper than could be done by an individual storage battery plant. The battery has a capacity of 5,000 ampere-hours. A 6 h. p. motor operates a pneumatic service used for exchange service and for cleaning of cable conduits.—M. SELLIER, Paris, *Annales des Telegr. et Telephones.*

RECEIVING ABSENT TELEPHONE CALLS.

The last issue of TELEPHONE ENGINEER described a special "absent" telephone service which has been used in Paris for some time. At the time no wiring diagram was available. This can now be given as in Fig. 4. As was said before, the subscriber may arrange for special service whereby his telephone is connected to a special operator at the exchange who will receive calls during his absence and then notify him of their contents at his return. A branch of the line of the subscriber is connected to the intermediate distributing board and then terminated in a jack *J* at a special switchboard. This jack *J* is connected to an annunciating disc whose coil *R* is connected to the line by way of a condenser. When the subscriber wishes to notify the operator of his absence, he sends an alternating current through the line by aid of his magneto. This current passing through the coil *R* makes the disc *A* of the annunciator drop. The fall of the disc closes a contact which connects the battery of 6 volts to the third wire of the subscriber's line and makes the cut-off relay operate. As a result the calling relay does not work under the action of the current from the magneto and the operator at the exchange will not be called by the ringing of the subscriber's telephone. The special "absent" operator then places plug *F* in jack *J*. The battery of 6 volts is then connected to the coil *D* by the contact which is set up at *PQ* and the disc of the annunciator is released automatically.

The operator can now receive communications, and when the subscriber returns will notify him of the contents. Then she pushes down the button *K*, which returns at *MN*, the connection of relay *C* with the third wire. The current which passes through this wire when one of the multiple plugs is placed in one of the jacks of the line will now make the relay *C* operate and will cut the circuit of relay *R*. No call will now reach this special operator from this line. If this service is not heavy enough to delegate a special operator the regular operator will withdraw the plug of the switch *B;* the fall of disc *A* will then make a buzzer sound and will notify the operator.—*Annales des Telegraphes et Telephones.*

EFFICIENCY OF PUPIN LOADED LINES WHEN COMPARED TO OTHER LINES.

At the request of the Austrian Telegraph and Telephone Department, E. E. Detritsch, a Vienna telephone engineer, has made extensive comparative tests regarding the relative efficiency of telephone lines using Pupin coils and those without these coils, as also lines using Krarup coils. Following are a few points of general interest:

1. Efficiency of Ordinary Telephone Lines: The lines measured showed in general about the same strength of wire, namely, 5, 4, 3.5 and 2.5 mm. (13/64, 5/32, 9/64 and 3/32 inches, or 0.26, 0.15, 0.14 and 0.09 inches). The damping coefficients or damping effects found for these wires are as follows:

4/13	in. wire,	bronze wire	beta (B)	0.0019
3/13	in. wire,	bronze wire	beta (B)	0.0028
2/13	in. wire,	bronze wire	beta (B)	0.0035
1/8	in. wire,	bronze wire	beta (B)	0.0044
1/13	in. wire,	bronze wire	beta (B)	0.0100
1/26	in. wire,	bronze wire	beta (B)	0.0132
1/52	in. wire,	bronze wire	beta (B)	0.0167

The rapid rise of the damping effect when passing from 1/8 inch wire to the 3/32 inch wire is due to the fact that the thinner bronze wire necessitated the use of another bronze mixture than that used in the heavier wire, which resulted in a corresponding decrease in the specific conductivity of the wire. One obtains a good picture of the efficiency of the various conductors, when relating the damping effect to that of a 5 mm. (13/64 inch) wire. The specific damping effect is beta (B) = 0.002. It has to be determined, therefore, what damping effect per km. (0.62 mile) of the wire used is equivalent to the standard of comparison of the 5 mm. (13/64 inch) bronze wire. The table is as follows: The damping effect of 1 km. (0.62 mile) bronze wire of:

4.0 mm (4/13 in.)	bronze wire is equivalent to 1.47 km (0.93 mile)
3.5 mm (2/13 in.)	bronze wire is equivalent to 1.84 km (1.34 mile)
3.0 mm (1/8 in.)	bronze wire is equivalent to 2.30 km (1.42 mile)
2.5 mm (1/13 in.)	bronze wire is equivalent to 5.30 km (3.28 mile)
2.0 mm (1/26 in.)	bronze wire is equivalent to 6.90 km (4.37 mile)
1.5 mm (1/52 in.)	bronze wire is equivalent to 8.80 km (5.45 mile)

of 5 mm (4/13 in.) standard bronze wire.

2. Efficiency of Ordinary Cables: There are three types of cables that are used by the Austrian department, two for party lines and ordinary telephone service with 0.8 mm. (1/32 inch) copper conductors, and the other with 0.6 mm. (approximately 1/32 inch) copper con-

ductors. The other type is a Krarup cable used for very important telephone service, such as between large cities and special government lines. Here 2 mm. (3/32 inch) copper conductors are used, wound with 0.3 mm. (1/64 inch) iron wire. This type cable is also used when communicating between the Vienna and suburban exchanges, i. e., trunk wire service. The specific damping effect for the three cables is as follows:

Krarup cables with 2 mm (3/32 in.) conductors beta (B) = 0.0140
Telephone cables with 0.8 mm (1/32 in.) conductors beta (B) = 0.0750
Telephone cables with 0.6 mm (1/32 in.) conductors beta (B) = 0.1160

The efficiency is somewhat better when a little heavier iron wire is used for winding around the conductors. The damping effect decreases slightly and the characteristic increases, which is of advantage to telephone service. If no iron wire is used the damping effect increases for a 2 mm. (3/32 inch) copper wire to 0.0260 and the characteristic drops down to the very unfavorable value of $Z = 243\, e^{-35°40'i}$. Special attention is called to the great damping effect of the ordinary telephone cables. The damping effect of 10 km. (6.2 miles) cable of 1/32 inch conductors is equivalent to that of 500 km. (310 miles) of 13/64 inch bronze wire, and the effect of 6.2 miles of 0.6 mm. (1/32 inch) copper line is equivalent to 610 km. (378 miles) of standard bronze wire.

11/64 in. bronze wire corresponds to the damping effect of 0.52 mile of wire.
9/64 in. bronze wire corresponds to the damping effect of 0.62 mile of wire.
7/64 in. bronze wire corresponds to the damping effect of 0.77 mile of wire.
5/64 in. bronze wire corresponds to the damping effect of 1.55 mile of wire.

It is therefore feasible to substitute telephone lines of 13/64 inch bronze wire up to lengths of 434 miles by 9/64 inch bronze wire, and for lengths of lines beyond 434 miles, bronze wire of 11/64 inch thickness, provided Pupin coils are used.

Pupin Cables: The specific damping effect of the Pupin cables in service is lower by almost half than that of Krarup cables having the same thickness copper conductors. The average damping effect of a Pupin cable is beta (B) = 0.0068, and 1 km. (.62 mile) of such a cable has no greater damping effect than 3.5 km. (2.17 mile) of bronze wire of 5 mm. (13/64 inch) thickness.

Efficiency of Complex Lines: In telephone lines made up of various types of lines the efficiency is always lowered by reflection losses. The magnitude of these losses stands in a certain definite relation to the difference in magnitude of the characteristics of the types of lines used in the telephone circuit. If these characteristics of the different types of lines are the same, then there are practically no reflection losses. For example, lines are made up of 3 and 4 mm. wire directly connected to a line of 5 mm. wire give no losses. On the other hand, to connect 2 mm. (3/32 inch) wire with another line of 5 mm. (13/64 inch) wire is dangerous, as the characteristic of the 3/32 inch line lies very near to 1,000 and is therefore much higher than that of the thicker wire line. The greatest losses are observed where lines with greatly varying characteristic are connected, as the line Triest-Zara, where long stretches have Krarup guttapercha cables with a characteristic of 300 connected to 5 mm. (13/64 inch) wires with a characteristic of 600, the losses being 0.35,220 at $\omega = 5{,}000$. Like great losses are noticed on the line Vienna-Bielitz, where Pupin loaded wires with a characteristic of 1,400 are connected to Krarup cables with a characteristic of 400, the losses being 0.21,525 with $\omega = 5{,}000$. Even when connecting Pupin cables direct to telephone wires the reflection losses are so great that the advantages of these cables through their low damping effect are lost again. These losses are not so great when Krarup cables are connected to heavy uncovered telephone wires. No losses

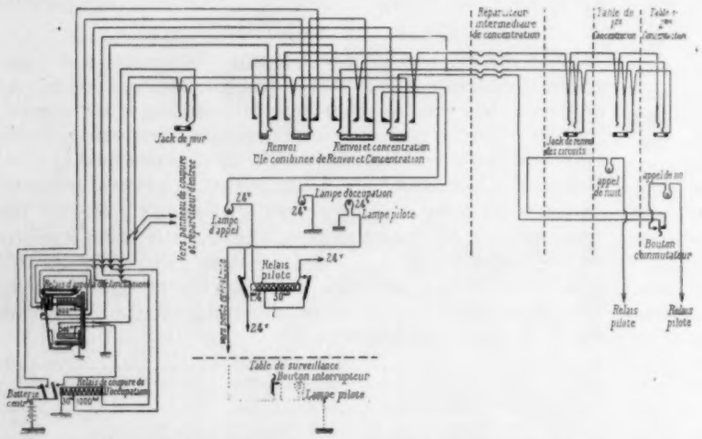


Fig. 3. Wiring Diagram for "Interurban" System in Paris.

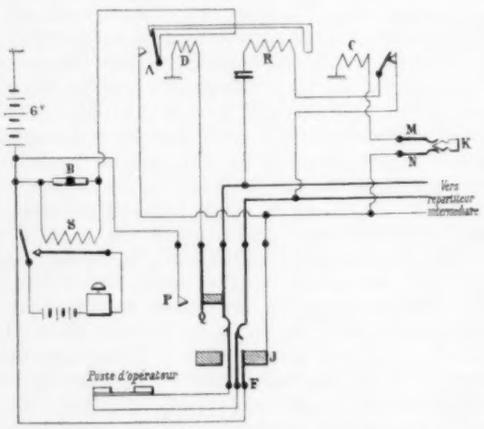


Fig. 4. Wiring Diagram for "Absent" Service.

On the other hand, the damping effect of the Krarup cable is very slight, 1 km. (0.62 mile being equivalent to only 7.3 km. (4.5 miles) of 5 mm. (13/64 inch) bronze wire. This damping effect is therefore much closer to that of a 2 mm. (3/32 inch) wire. This is due to the fact that the material used for this smaller bronze wire is of greater strength than that for the heavier wire and therefore of almost double the resistance as the copper wire in the Krarup cable.

3. Efficiency of Pupin Lines: The tests made with the telephone lines equipped with Pupin coils showed results which corresponded exactly with the theoretical computations. With Pupin coils of 0.1 henry self inductance and an effective resistance of 5 ohm, a frequency of $\omega = 5{,}000$ is obtained, if the coils are used at distances of 6.2 miles. The damping effects under these conditions were as follows:

11/64 in. bronze wire, beta (B) = 0.0017
9/64 in. bronze wire, beta (B) = 0.0020
7/64 in. bronze wire, beta (B) = 0.0024
5/64 in. bronze wire, beta (B) = 0.0048

When compared to the damping effect of a 5 mm. (13/64 inch) bronze, the damping effect of Pupinized telephone lines is as follows:

at all are noticed when open wires are connected to the ordinary telephone cables, which is to be expected since the characteristic of the copper conductors in the cable of 0.8 mm. (1/32 inch) diameter have a characteristic of 590, which is about the same as that of heavier uncovered wires. It would seem from the observations that Krarup cables or ordinary telephone cables can be connected to uncovered ordinary telephone wires as described, without disturbance of the various electric factors. On the other hand, connection of Pupin loaded telephone lines to Krarup cables or of Pupin cables to telephone lines must be avoided.

General Principles for Pupinization of Lines: The reflexion losses that occur when Krarup cables are connected to pupinized telephone lines are so great that they must be watched in the case of lines whose total damping effect is $B1 = 1$. With increasing length of the pupinized line this fact becomes less noticeable as the losses are distributed over a greater number of miles. The increase of efficiency through the Pupin coils would then be the greater factor.

Pupinization of uncovered telephone lines is only advisable for long lines, whose damping effect (B1) without Pupin coils is at least 2 to 2.5. In this case the gain would be from $B1 = 1.0$. Pupin lines should always be used for direct long distance lines without intermediate stations, *i. e.,* between large cities having direct telephone connection. The connection of cables of low characteristic within pupinized lines should be avoided and the line should be as uniform in character as regards thickness and material of wires as possible.

It was finally attempted to eliminate the bad effects in reflection losses noticed when connecting pupinized uncovered lines to Krarup cables by various means. It was found possible to load cables having fairly heavy conductors with self-inductances in such a way, that they were given a charactersitic which made them suitable for connection to Pupin lines as well as to ordinary lines. The coils need not be built in at special points either, although a certain systematic construction is advisable. There are no objections to loading Krarup cables with Pupin coils. The Krarup cables have an artificially increased self-inductance and it would be sufficient to insert every 3 to 3.5 miles a Pupin coil of 0.2 henry inductance in order to raise the characteristic of the cable from 400 to 800 or 900 and decrease the damping effect from $B = 0.0140$ to 0.0070 or 0.0080. The cost of pupinization would be about one-third of the costs of copper conductors used in cables without the iron winding.—*Telegr. u. Fernsprech Tech.*

THE TELEPHONE IN WAR.

How great a part the telephone has played in the present European war is well known, and the following article is a verbatim translation of an account received from a letter from a soldier at the front, who in private life was a telephone engineer and was used for that service in the war. The letter is dated November 1, and is as follows:

On the 25th of October the chief of the battery (heavy artillery) called me and said that he would like to install an observation post further to the front to see what effect the shells from his battery had on the enemy's position. I told him that I had no storage battery and no telephone wire. He only answered: "I have to use that line and rely on you to install it. At half past four (it was then 11 o'clock a. m.) the line must be ready for business." So it was up to me and I had very little time to get the needed supplies. I threw myself on horseback and galloped 15 km. back to the nearest town and finally succeeded in locating three elements for the storage battery and 2,000 meter of wire. I rushed back again and then received a chart showing the enemy's positions and the road to take. At 2 o'clock I started on my dangerous trip with the coil of wire on my back and the battery, armed with revolver and sabre. I had hardly gone 500 meters in front of our battery when the enemy opened fire, as I was in an open field and I had to proceed on my stomach, creeping from cover to cover. Through meadows, fields, ditches, my way went, with shells bursting overhead without, however, wounding me. The position to which I had been assigned was 2,000 meter ahead and finally I reached the outposts, a company of infantry, and looked around for some vantage point where the telephone could be installed. Finally I located an empty house that had been shelled but had its roof still in passable condition. I managed finally to reach the latter and climbed to the roof, uncoiling my wire as I went along, and found myself within 120 meters of the hostile trenches. I could distinguish faces and hear the talking. I then climbed down again and telephoned my observations to the battery in the rear. I was told to stay there and wait for the observation company with their instruments, who arrived after about an hour. Now the position of the enemy's nearest trenches was telephoned back and the effect of the shells watched. After every shell observation was made and the accuracy or fault of the aim telephoned back to the battery. The telephone squad stayed at the outpost for five days, food being brought at night and absolute silence observed during the day, for, if the enemy saw us, he could have dislodged us with one or two shells. Finally we were ordered to return with our equipment and left that dangerous locality without the enemy having located our telephone station.

Another letter brings the following acount: "The staff of the battalion to which I belonged was suddenly cut off from telephone communication, as the line must have been damaged or cut somewhere. It was imperative that communication should be restored at once. A young lineman, a volunteer only 19 years of age, did not even wait for orders, but took up his telephone repair instruments and his rifle and went off to find the break. About 15 minutes later the telephone worked again. A short time after, four of the Red Cross staff brought the little volunteer telephone lineman in a dying condition, half his side torn away by a shell. Dying as he was, he still made his report: "Telephone line repaired again," and then died.

Automatic Proposed for Miami

Following an application for a franchise to use the streets of the city of Miami, Fla., for telephone wires, the Automatic Telephone Company, Key West, was given assurance by the city that the matter would be gone into thoroughly. A committee will go over a tentative franchise, and report back at a future meeting of the city council. The franchise will then probably be left with the voters.

There is only one telephone in use to every ten persons in Miami, and there is room for another company, with an increased number of telephones of about 1,400 would result in such event. The rate will be uniform and the rates will not be raised. These rates will be: business, $3.50 per month; residence, $2; extension telephones, fifty cents; and there will be no extra charge for desk telephones.

The council appointed as a committee to meet with the representatives of the Automatic Telephone Company, Councilmen Ralston and Hefty; Mayor Watson, and City Attorney Rose.

An American consular officer in the Far East has transmitted a report, together with blue prints, specifications, etc., relative to an opportunity for the installation and supply of equipments for a telephone system. A copy of the report may be had on application, referring to "Telephone System, No. 17819," and the blue prints, etc., may be examined at the Bureau of Foreign and Domestic Commerce or its branch offices.

The Situation in Chicago

What the Promoters and Politicians Could Do with the Automatic System

BY ARTHUR KNEISEL

THE following interconnection plan canvass of the dual telephone situation confronting the City of Chicago is intended to preserve the city's rights, enlarge the utility to the public and afford such protection to the private interests involved as they may be entitled to.

I wish to qualify this voluntary action by referring you to the fact that between the dates September 16, 1914, and June 9, 1915, I was employed by the City of Chicago as a telephone expert in the Department of Public Service and carried the title of assistant telephone supervisor. My principal occupation was directed to the automatic telephone situation as outlined in the 1914 annual report of the Department of Public Service. I feel that I owe to the present administration such assistance as my experience, gained through my employment by the city, will afford, and it is therefore respectfully submitted as follows:

At present there are four parties vitally interested in this controversy:

1. The telephone using public and taxpayers of Chicago, represented by the City Council, and more particularly by the Committee on Gas, Oil and Electric Light.
2. The security holders of the Chicago Utilities Company.
3. The Chicago Telephone Company and the A. T. & T. Company.
4. The Independent telephone manufacturing interests.

To analyze the most probable viewpoints of these parties: The security holders of the Chicago Utilities Company (automatic telephone) naturally are unwilling to lose the money invested in what they considered a legitimate enterprise, and are willing to consent to a sale, or, in fact, any action which will secure to them all or as much as possible of their investment. Therefore they are no doubt willing to entertain a proposition which may not only preserve their investments, but earn financial returns on them.

The Chicago Telephone Company and the A. T. & T. Company have stated through their representative that they do not know the value of the property they propose to purchase, and that time only can tell what disposal they would make of it. In Detroit, Michigan, and other places they scrapped the Independent systems acquired by purchase. Mr. Sunny admitted that physical connection between automatic and manual systems is possible and has been and is now in successful operation; that properly maintained automatic systems give improved service has not been controverted during any of the hearings. Since interconnection is feasible and can be arranged to be of financial advantage to the Chicago Telephone Company, its objections to a plan of interconnection must be those of policy. Possibly it is the fear of the effect as a precedent for the rest of the country if they assent to interconnection in Chicago. It is the same fear which actuated the railroads to oppose interchange of railroad cars years ago. This is a natural timidity, but as in the case of the railroads, interchange of service is in the interests of public convenience and necessity, and the public is always willing to pay for its freight.

The telephone using public of Chicago objects to a sale of the property to the Bell interests; probably not so much from a desire to confiscate the property of the bondholders for failure to comply with the contract, as from the certainty that it must pay dividends on capital stock for which no corresponding physical value exists. Assuming that the A. T. & T. Company were permitted to purchase, and that in reselling it to the Chicago Telephone Company it added no profit to the purchase price, the latter company would add $6,300,000 to its capital account, which, according to Mr. Sunny, it expects to have taken into consideration in any future rate revision. The telephone using public would, of course, be compelled to pay dividends on this $6,300,000, although the report of City Electrician Ray Palmer states that the actual value to the Chicago Telephone Company of so much of the automatic property as can be used in building up its manual system is $1,875,000. Seemingly, with the two alternative plans of forfeiture with confiscation and permitting a sale to the Bell Company, we have the alternatives of taking property from 1,463 bondholders at one swoop in one instance, or of taking property from 375,000 or more telephone subscribers for many years to come, in the shape of dividends paid on capital stock for which no physical equivalent exists.

The viewpoint of the Independent manufacturers is along different lines, and need not be discussed here.

Apparently all discussion held thus far before the committee tends towards the belief that the city may have legal right to acquire, through forfeiture, the automatic telephone property, but some interests hold that such action would injure the credit of the city.

However, no one contends that the city should relinquish its forfeiture rights.

A sale of the property to the Bell interests must be sanctioned by the Illinois State Public Utilities Commission and the authorities at Washington; but it is highly questionable that either of these will object if the City Council consents to the sale, on the ground that the latter has given the matter careful consideration and its decision represents the will of the majority of people on a question primarily of local importance.

While the State Public Utilities Commission and the national authorities might well hesitate or might even condemn an action on the part of the city which confiscated the property of the bondholders, they probably will sanction and assist such action as will renew and encourage the opportunity for the Chicago Utilities Company to reimburse these investors, particularly if that action works no hardship on any party.

The two alternatives—forfeiture with confiscation, or a sale to the Bell Company—are by no means the only solutions of the problem.

My plan for the solution of this problem is as follows:

1. The passage of an ordinance granting the Chicago Utilities Company the right to continue business under the franchise of 1899 and its amendments, provided the Chicago Utilities Company will lend its best efforts in assisting in establishing interconnection between the automatic and manual systems. To do this it must

put the existing plant in good working order to adequately serve its present and future subscribers. This should not require a great amount of capital for it is at present a going concern.

2. The passage of a second ordinance providing for interconnection with the Chicago Telephone Company on a measured service basis for which the present rates of the latter company are to be charged on all interconnecting business originating on automatic stations, and that the receipts of such business be divided, fifty per cent to go to the Chicago Telephone Company and fifty per cent to be set aside for the interconnecting exchange.

3. The passage of a third ordinance providing for the establishment of an interconnecting system in connection with an automatic private branch exchange which serves the telephones of the municipality only. The interconnecting system to be operated by the Telephone Bureau of the Department of Public Service. The surplus remaining to the credit of interconnection after its carrying charges are paid could be deposited to the credit of bond redemption.

ADVANTAGES TO BE SECURED.

A vital reason why Chicago should own and operate an automatic private branch exchange in connection with universal service is, that it is paying the Chicago Telephone Company $44,000 per annum for service rendered over 1,087 lines (1,316 telephones). This includes $10,000,000 per year for the *so-called free service* rendered over 272 lines (388 telephones) and 55 trunks installed in the City Hall, but does not include the amount paid on excess calls over the measured service lines used by the city. It would be extremely difficult to determine how much this amounts to from the city comptroller's records, owing to the fact that the telephone bills paid by the city are charged against the accounts of the various departments which receive the service, and are not aggregated as telephone bills against the city. Therefore the saving would be greatly in excess of the above $44,000 referred to.

According to the franchises granted to the Chicago Telephone Company and to the Illinois Telephone and Telegraph Company, the city has the right to the free use of wires in the cables and on the cross arms of both companies for its own telephone system. It also is to receive, free of charge, as many Bell transmitters and receivers as it requires for its own system. Thus far the city has failed to take advantage of these valuable considerations in the franchises to an appreciable extent.

It might be added that the city not only pays the Chicago Telephone Company $10,000 per year for operating the Main 447 switchboard, but likewise pays $10,400 per year for operators' salaries on auxiliary private branch exchanges, which to a considerable extent duplicate the work of the Main 447 operators to no particular advantage.

Installing a municipally owned private branch system would enable every telephone now paid for by the municipality to be connected to its own system (if the before mentioned valuable considerations are taken advantage of) and an enormous present expense would be saved in the city's telephone bills. The cost of a private branch exchange system giving improved service to the City Hall and of sufficient capacity to serve eventually all of the municipal telephones would be approximately $50,000.

Beginning with the saving of the $44,000 now paid by the city to the Chicago Telephone Company, an additional saving could be effected in that all of the city's calls would be secured at a minimum measured service rate due to their being concentrated under one bill, in exactly the same manner as Marshall Field and Company secures a minimum rate by concentrating all the telephone service, covering 1¼ loop blocks, into one private branch exchange. A detail study of this situation would require much more time and space than this discussion contemplates.

PROBABLE COST OF AN INTERCONNECTING SYSTEM OPERATED BY THE CITY.

Following is an estimate of the investment required to install semi-automatic apparatus to serve 40,000 subscribers (this being the number claimed by the attorneys can be served with but little additional capital):

Installation cost of interconnecting system sufficient to serve 40,000 automatic, and 375,000 Chicago Telephone subscribers	$ 267,000
Cost of private branch exchange to serve the city departments	50,000
Total	$ 317,000
Annual carrying charge	235,000
Estimated revenue derived from 20,000 and 375,000 subscribers' interconnecting calls	$1,200,000
Fifty per cent to go to the city for operating the interconnecting system	600,000
Surplus (available for bond redemption)	365,000

This $365,000 annually would be available to amortize the cost of installation, and might be used in part to assist in amortizing the indebtedness of the automatic telephone property.

If the automatic system proper had 20,000 subscribers paying the franchise rates, they could no doubt pay the dividends estimated when the system was first engineered. It is held that with the public's confidence restored in the automatic system by the fact that the city operates the interconnecting system, it would not be difficult to secure over 20,000 bona fide subscribers. One possible result of interconnection has not been discussed heretofore: the ability to get flat rate automatic service and Bell service from the same telephone would probably cause the cancellation of many flat rate Bell contracts—a class of service which the Chicago Telephone Company is rendering at a loss.

SUMMARY.

The above plan, summarized, presents the following primary advantages:

The public retains its rights to compensation under the franchise grants.

The telephone users secure improved and extended service.

The Chicago Utilities Company is given a greater opportunity to work out its salvation along healthy lines.

The Chicago Telephone Company's interests are not jeopardized nor permitted to capitalize a possible failure.

The municipality will save many thousands of dollars which it now pays annually for a very inadequate service and secure a manifestly superior service under its own control, as it should have, to more effectively utilize the telephone in the conduct of its great and growing business.

Hiring Harvest Hands by Telephone

By cooperation between the telephone interests and the farmers of Kansas, about every family having a telephone, the state's requirement of 48,000 extra men as harvest hands has been met with striking efficiency.—*Chicago Commerce.*

The Case of the Keystone

Some Excellent Arguments for Telephonic Competition Based on Actual Practice

The material in this article was originally prepared for the Keystone Telephone and Telegraph Company and published in a booklet entitled "The Case of the Keystone." Its object was to counteract certain local Bell efforts and publicity. Therefore, we present it not wholly for its interest as a story, but as an excellent example of Independent publicity, intended for public consumption.

BY EDWARD M. COOKE

AMONG the thoughtless we all hear a good deal of questioning, in the course of our daily work, about the propriety of competition in public utilities. This sort of talk is largely the result of misinformation emanating from those who conduct monopolies. They thrive on monopoly and naturally want us all to believe in monopoly. Their business is much more easily managed and they make far larger profits so long as they continue that monopoly. The desire for this exclusive privilege is not confined to the public utility owners. It is inherent in us all, whether we are public service corporation managers, bankers, druggists, grocerymen, manufacturers or doctors. But wherever you find competition absent, as surely as the day follows the night, the public pays for it in increased cost or inferior service, and usually in both ways.

As a matter of fact, so long as human nature remains what it is, we shall need competition in all the activities of life. We needed it as youngsters on the playground and in the school room. We need it as grown-ups—only more. We need its stimulating influence. We need the restraint of it. It is a more potent righter of wrongs and regulator of business than any possible concoction of our legislative bodies. So strong is the general conviction of this necessity that protection in the field of competition has become the national fixed policy of all political parties. It has long been the constitutional policy of Pennsylvania and other states.

The New York Court of Appeals in a noteworthy decision says: *There is no stronger inducement to the managers of a public service corporation to serve the public well than a healthy apprehension that a rival concern will do so. It is sometimes argued that the presence of two telephone systems in a given district is a disadvantage to the community, which is best served by one system reaching all subscribers; but one system will never be made to reach all subscribers as cheaply as would otherwise be the case if the possibility of competition is destroyed.*

I do not quote the above because it comes from a court of law. I quote it because it comes from a group of intelligent men who are given to careful study of all sides of a question, and trained to judicially pass on its merits.

Telephone competition in Philadelphia is directly responsible for our low telephone rates. Do not forget that prior to the advent of the Keystone Telephone Company the unlimited business service telephone cost $160.00 with comparatively few subscribers. It costs $90.00 now in a wide field saturated with telephones. Our company reduced the pay station charge from 10 cents to 5 cents. The other company followed suit. Just think of the saving in that one item to the masses of Philadelphia people. Just compare general telephone prices in our city with those in other big municipalities where monopoly rules. We shall then learn an impressive lesson on the subject of competition.

Edward M. Cooke, Vice-President Keystone Telephone Company, Philadelphia.

Then we hear about duplication. If there is an economic evil in this, it is bound to exist wherever and whenever competition exists in all fields of human endeavor. As against the waste due to duplication, count the gain in improved mechanical devices, in progress of methods, in service to the public, in reduced cost. There is a single block up the street where six banking houses thrive side by side. There is a section near at hand where a half dozen great department stores prosper, almost elbow to elbow though they be. Eight or ten important and successful daily newspapers are in the Philadelphia field reporting our happenings. Surely here is duplication in all three cases. Duplication in investment, duplication in plant and organization, duplication in management. Yet does anyone say that this duplication is not of evident and lasting benefit to the public? The conditions would be well nigh intolerable if a monopoly existed in any of those three cases. The conditions were almost unbearable before there was telephone competition in Philadelphia.

Why, Indianapolis paid 90 cents for gas until a new privately owned company came in and then through the natural process of competition the price was reduced to 60 cents. Thirty cents saving per thousand feet through a long series of years in a city of 230,000 people will pay for a good deal of duplication.

But some one says: "I don't like two telephones on my desk. They are a nuisance." That is the argument of the unthinking—the namby-pamby—the effete. It is hardly the opinion of the red-blooded doers of the world. On the same desk where you object to having two telephones, perhaps you have two ink wells. You don't confine yourself to one door in your house. You don't object to a half dozen elevators in yonder store. You welcome the services of two or more messengers to do your errands. You may have a dozen push buttons for various services at your side. You undoubtedly find a plurality of rubber stamps a convenience. Each one has its own sphere of usefulness.

There is a merchant over on Market street, who has both telephone systems and he tells me that he "keeps them both humming," to use his own expression. He says that if there was a third system he would have that

also. He reasons that the more facilities he has for attracting and transacting business, the more business he will get. His prosperity is evident to all.

On the other hand, I have a banker friend who does not have the Keystone telephone. He says that if he installed it the operator would be too busy to do anything else. That is in itself a fine compliment for the usefulness of our system. I would suggest to that banker, however, that if he dispensed with the telephone altogether his operator would have still more leisure. And if he also closed and barred his front door, the whole bank would be in complete repose.

Certainly those two telephones reduce to the minimum the possibility of ever being off from telephonic communication with those you desire to reach and who wish to reach you. Certainly they save time and trouble and add to the efficiency of your business management by practically eliminating the "wire busy" blockade on both incoming and outgoing calls.

I have a friend who from boyhood has always been devoted to me and I to him. But one thing he has never understood. He never could comprehend how I could engage in the management of a competing telephone system. He is a big, broad-minded man in other ways, but two telephone systems are to him a crime. So we don't often talk about that subject, though we do often discuss his own highly competitive and greatly successful business. And we both agree that while his business and the public do suffer a bit from duplication and all those other ghosts that gather in the mental garrets of the defenders of monopoly, we also agree that competition is the very life blood of at least that particular business. We part company only when we try to offer that life blood of competition to the telephone trade.

I sat the other night in the comfortable study of the new country home of this good friend. We talked long on many subjects and several times were interrupted by the telephone bell. The instrument rested on the desk at my friend's elbow and was easily responded to. But finally a bell with a new note rang. My friend arose and went over to the corner where he raised an instrument from a shelf and began a conversation. When he was through I asked him about this second telephone and he explained that it was a station on a private system covering the various buildings of his farm. I suggested to him that if he objected to two telephones he could arrange to have his private system connected with the other and so do away with one of his two instruments. No, he preferred it just as it was. Ah! my friend, your name is not inconsistency, but it should be. Here you have been railing at me for years about my connection with a competing telephone company—about the nuisance of two instruments, two bells, two cords, and so on. And here I catch you red-handed with two telephone systems in your own home. And you not only do not object to the so-called nuisance, but you openly declare that you like it. So much for the insignificance of the two-telephone argument.

Then remember that both telephone services can be had at a price comparatively lower than the cost of one service in large cities where there is no competition. I claim that the Keystone service is the best telephone service in the world. You can carry on a conference over our lines with more comfort and satisfaction than any I know. The transmission of sound is better because of the character of equipment. I believe the general operating service is quicker and better. In the recent report of the Electrical Bureau the results of several hundred tests, made without our knowledge, as to promptness of service, are given. It is shown that on an average 6.9 seconds were required to reach the bureau over Bell lines and 3.7 seconds over our lines. That means if your house is on fire it takes only about half the time to report it by Keystone telephone.

There are, of course, a number of reasons for the goodness of our service, but the fact that we must meet hard competition is not the least of them. That is exactly what competition accomplishes for the public.

We have a lot of buncombe handed to us about the evils and injustice of the flat rate. One thing we can all agree upon and that is that unlimited service is faster than the limited. Neither the subscriber nor the operator have to devote a part of their time to the keeping of accounts involved in a limited service.

As a matter of fact, all telephone companies have more or less unlimited service. Some of those companies confine it to certain localities, certain zones, certain classes of business. Others, like ourselves, offer it to all. Keystone subscribers in Philadelphia, without distinction, can have either measured or unlimited service. If there is an unlimited service, then it is not confined to telephony. We find it everywhere. Your storekeeper delivers his goods to you by means of his own wagons. That is an unlimited service. Sometimes he sends them to you by mail, by parcel post, by express. Then either you or he pays for the delivery of each package. That is measured service. There are companies that will furnish you medical or other service by the year. No matter how often you are sick you pay annually just the same. That is unlimited service. The ordinary doctor will charge you for each visit. That is again measured service. If you get on a street car in Philadelphia, you pay five cents, whether you ride a block or ten miles. That is once more unlimited service. You pay annual dues for service at your lodge or club. That is flat rate service. Thousands of men and women in this country perform their daily tasks on what is known as the "piece work" plan. Theirs is a measured service. Other thousands work for a stipulated daily or weekly wage. Theirs is an unlimited service. And so examples of two kinds of service, without number, can be furnished.

I hear occasionally a man say that he can't use the Keystone telephone because it does not cover the whole business field. That is not true. May I remind you that the Keystone Telephone System's business, one of the most important in Philadelphia, is conducted entirely by the Keystone service alone? Its supplies are purchased by Keystone telephones. All its varied activities are directed by Keystone telephones. Reports from all its operations are made over Keystone lines.

The use of the other service is largely a habit with a lot of people. It is an expensive habit when the Keystone Telephone unlimited service is available. The same business man who habitually neglects this unlimited service would stand aghast if he saw the office boy throwing postage stamps out of the window. Yet both boss and office boy are reaching the same uneconomical end. If you don't have a Keystone telephone, you not only lose money yourself, but you put an extra and wholly unnecessary charge on the other fellow, who has an unlimited service, when he calls you.

You will remember that recently a city water main on lower Market street broke. Many of the basements in that section of the city were flooded, including the Keystone and Bell exchanges. Fortunately, the water did not seriously hurt us, but the Bell exchange was less

lucky and was, in a large measure, temporarily out of commission. The result was that about ten thousand messages were that day diverted from the Bell lines to the Keystone exchange in that district. On the former, those messages would have cost their senders an average of perhaps three cents each, or a total of three hundred dollars. On the Keystone lines they were carried without extra charge, and three hundred dollars saved. If the same conditions had existed for a year or for three hundred business days, ninety thousand dollars would have been saved in that section of the city alone. So business men can and do use the Keystone lines and they can and do save largely in cost thereby.

The above incident shows more plainly than any argument I can make that those who have the Keystone unlimited service should issue iron-clad orders that this service should be used wherever possible. If they don't have the Keystone service, then the rules of good business would seem to demand its installation.

But the question of the usefulness of the Keystone telephone is, of course, largely dependent on the proper distribution of the equipment. One cannot expect a concern occupying a four-story building to get much satisfaction out of a telephone service represented by a single station on the ground floor. The convenience of the users must be adequately met by a general distribution of stations throughout the business home. I have in mind one important Philadelphia establishment that, on a comparatively small equipment, was averaging only thirty-five outgoing calls per day last December. The distribution of stations was too limited to make the service convenient for the employes. On January first the owners of this plant decided to largely increase the equipment. A station of the Keystone system was installed in practically every office and work room in their building. Remarkable results came quickly. On February first the daily average of outgoing telephone calls in that establishment on Keystone lines had grown to more than six hundred. The increased cost of the additions to the unlimited service equipment is about $900 per year. The actual net saving in annual expense is more than $3,200. So this question of the importance of distribution is one that must be impressed on the minds of all who are selling our service.

The Keystone Company is the home company. That does not mean that as a matter of pure sentiment it should be supported—though surely other conditions being equal it naturally would call to it the favor of our home people. But the fact that it was constructed by home people, largely with home money (eleven million dollars of it in hard cash) and managed by home people, means more than a question of sentiment. It means that those who are subscribers come in personal, daily contact with those who direct our affairs. It means that our owners and directors cannot escape a personal knowledge of our faults and our virtues. It means that their interest in us, and their pride in our efficiency is and must be far greater and far more effective in a demand for excellence in service than is possible for those to feel who are foreign owners and directors. It means that our machine is more carefully and jealously watched. It means that our standards of equipment must needs be higher. Our training of operators must be more painstaking. Our rules of courtesy and promptness in our dealings with the public are more rigidly adhered to.

I think you know how much I deprecate anything in the nature of an unfair attack on our competitors, but in justice to ourselves it was necessary for me in this frank letter to make certain allusions to and certain comparisons with the other service. I wish to impress our people with the fact that we have a valuable and wanted thing to sell and that we can confidently offer it and vigorously press its sale. For the rest I believe in attending largely to our own knitting. Let us live and let live. Make our service so good, our promptness and courtesy so marked, our usefulness to the community so notable, that we shall not have to appeal on any other grounds than the excellence of the Keystone Telephone System.

A. T. & T. and the Wisconsin Company

The American Telephone and Telegraph Company owns 99.2 per cent of the stock of the Wisconsin Telephone Company, according to testimony offered before the Wisconsin State Railroad Commission in Milwaukee, Wis.

During the hearing, the first on the petition for a re-adjustment of telephone rates in Milwaukee, business connections of the Wisconsin Telephone Company were revealed, as well as the methods employed by the company in establishing rates.

Points brought out tend to prove that the telephone company pays to the American Company over and above its dividends on the stock held, 4.5 per cent of its gross receipts in return for financing and supervision of the local concern and for telephone transmitters, induction coils, etc.

In addition to this, testimony established the fact that the Wisconsin Telephone Company has an agreement with the Western Electric Company under which the electric company acts as purchasing agent. Under this contract the electric company agrees to deliver to the telephone company all telephone appliances manufactured under the license of the American Bell Company and also to purchase and deliver to the local company all other appliances and supplies. And, while the telephone company agrees to purhase all these things from the electric company, it also pays the electric company a commission for being allowed to do so.

Central Union and A. T. & T. Compact

Evidence to be introduced in the suit brought by minority stockholders of the Central Union Company against that company and the American Telephone & Telegraph Company will show that the hundred mile contract was used to the advantage of the latter company to the detriment of the former, according to counsel for the complainants, in his opening statement before Judge Dever in the Superior court, Chicago.

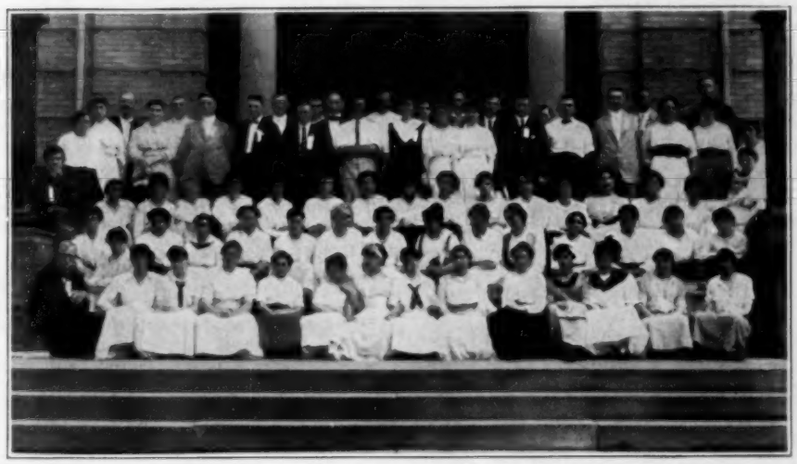
Under the one hundred mile contract, the Central Union Telephone Company was to handle all business in its territory between points less than that distance apart; towns more than 100 miles apart were to be accommodated by American Telephone & Telegraph connections, where those connections existed.

In order to take advantage of this contract business which the Central Union could have handled by one connection over wires of 101 to 102 in length, was carried as far as 250 miles in a round about way and through several connections by the American Company. Where the contract could be made to serve the interests of the parent company, it was enforced; otherwise, it was forgotten.

Operators' Meeting in Athens, Ohio

And Other Chronicles of Activity Among Independent Girls

THE Ohio University at Athens, Ohio, opened its auditorium in Ewing Hall on Tuesday and Wednesday, August 3 and 4, to ninety-nine independent telephone operators, from twenty-one exchanges throughout the counties of Athens, Fairfield, Hocking, Meigs, Muskingum, Perry, Ross, Scioto, Union, Vinton and Washington, who met as a school of telephony. Study of and drill in the new rules recently published by the Ohio State Telephone Company, for the expediting of its long distant work at the satisfaction of its customers everywhere, was the primary object of the meeting.



Operators at Athens School.

These meetings have been held in the eleven districts into which the state has been divided for the purpose of this instruction.

F. W. Bush, editor of the Athens *Messenger,* welcomed the operators, and President Alston Ellis of the university replied aptly to the welcome, and added, for the state, the greeting of the university.

The actual work, as a school, then began, with W. S. Vivian of Chicago as chief instructor; his staff of assistants, who together have gone the entire circuit of the state, being Q. E. Elwell, traffic manager from Cleveland; T. J. Tune, of like position in Columbus, and Mrs. Kathrine M. Kirby, traveling operator.

The necessity for prompt and satisfactory service to the public at large was emphasized, and the method of obtaining it was explained and made practical by the use of three temporary switchboards which were established in the room.

The visiting operators were entertained by the Athens County Home Telephone Company and the Ohio State Company, and everything had been done on the part of C. L. Jones, manager of the Athens Company, to make the occasion the success which it proved to be.

A drive followed the second session of the school, and in the evening the Majestic theater was filled at a special hour, by operators, visitors and stockholders, where a special program for the occasion was rendered, after which an invitation was given to adjourn to Dalton's Dancing Academy and accepted by many.

The sessions of Thursday were occupied with continued instruction in the work of the exchanges.

Goldie Cruch, Sullivan, Ill.

Efficiency

BY GOLDIE CREECH, SULLIVAN, ILL.

DURING the operators' school held in Sullivan, Ill., June 15 and 16, which I had the privilege of attending, so many splendid ideas and suggestions were presented in such a delightful manner by Mr. Vivian that I was very much impressed by the absolute necessity of efficiency in operatinf, and what it means to be affiliatel with and identified in such a great work as telephony.

In 1876 telephones were invented and messages were transmitted a few miles. The possibilities of telephony were foreseen and year after year vast sums of money have been spent improving that wonderful invention until today magnificent equipment is to be found installed everywhere.

But with all these facilities there is still another thing necessary to give good telephone service, and that is *efficiency operating.*

An efficient operator must first of all be of good character, for character building is the first requisite of success. She should be intelligent, healthy, sensible, and have good eyesight and good hearing. She should realize when she affiliates herself with any telephone company that she has taken upon herself one of the most honorable and responsible positions to be obtained. She should realize that she is the saleslady for that great company which has placed her there to sell the very best telephone service. She is the representative, the one who represents her company hundreds of times each day to the public. So why should she, too, not feel that she is a part of this great work. She has something to look on and upward to. Always studying to show herself, approved and going out into the realms of the unrequired where duty demands it. She is the one with whom practically the destiny of this great scheme lays to prove if it is a success or a failure. She should train her voice to a low, sweet tone. When dealing with the public in the

capacity of a telephone operator often expressions are misinterpreted and bad impressions are made, so the utmost care should be exercised in voice training. It is said that the voice is the sounding board of the soul. She must be courteous, good natured, impartial. She must not look upon her work as a job by which she will be able to make a little extra pin money, but she must go into her work with a willingness to serve, with an energy to do the very best at any time and under any circumstance and with an ambition to achieve something for there is always room at the top for proficiency. She must be accurate, for nothing so agitates the public as carelessness, and she should have speed and must be punctual and prompt at all her duties.

Are we, as operators, willing to put ourselves to the test? Can we conscientiously say that we are striving to become all that a good efficient operator should be, trying each day to perform our duties in a bright, cheerful manner? If we can, there are better things ahead for us.

But on the other hand, if we are not willing to stand the efficiency test, if we are not willing to examine ourselves, if we are only willing to do just what is absolutely required, abusing every privilege that is granted, caring nothing for the company's interest in which we are employed, thinking only of ourselves, reporting on duty a few minutes late several times during the week, being discourteous on many occasions, we may not expect to win many favors. And we have no one to blame but ourselves. Don't be satisfied with a little. Don't merely exist, but try to accomplish something, try to become an operator that your company will realize has its interest and welfare always in mind, and before long you will receive the reward for your efforts.

In the Sullivan office we have a four-position Monarch magneto switchboard with 734 subscribers and with nine operators to handle the traffic that passes over this board. Since the operators' school it has been handled in a much more efficient manner than ever before.

[My experience in telephone work began in the office of the Moultrie County Telephone Company in 1907, which position I held until 1910. During the time I was employed in that office it was taken over by the Macon County Telephone Company. In this office the work was very light, as the board was only a 50-drop board, but the work was pleasant to me and upon resigning in Dalton City I immediately took up my duties as day operator in the Sullivan office, which at that time was owned by a Mutual Company, but was taken over in a short time by the present company which immediately began to build up the exchange. In 1913 I was promoted to chief operator, bookkeeper and collector, which position I am now holding.—Goldie Creech.]

Bowling Green Employes' Meeting

A MEETING of all the employes of the Bowling Green (Ky.) Home Telephone Company was held at the office of the company on Tuesday night, June 8, 1915, for the purpose of discussing how each department could be more efficient in their work. There was a general discussion on the subject of efficiency with a few words by H. P. Myers as follows:

Efficiency is a misunderstood and misapplied word. To many it means system and detail, but according to my way of thinking, such is not the case, as efficiency is, first of all, thoughtfulness and getting the best results with the best methods. All of our present systems of management are worthless without the fundamental element of personal efficiency, the desire of the employes to show better results. A telephone organization to be efficient must look forward and readjust its service so that its work may be not only satisfactorily efficient, but progressively effective.

The following resolutions were offered by Mr. Myers, seconded by Miss Mattie Backus and unanimously passed:

Resolved, That we, the undersigned employes of the commercial, operating and plant departments of the Bowling Green Home Telephone Company, hereby pledge ourselves individually and collectively to put forth our very best efforts to make the year 1915 the most prosperous since the organization of the company, by giving first-class service, high maintenance of lines, which will make one hundred per cent collections easy.

It is further resolved that we hereby pledge ourselves to the most efficient performance of the duties placed upon us and to hold before us throughout the entire year the word "Efficient," and to that end the results obtained in all departments for the year may record one hundred per cent efficiency.

It is further resolved that each employe will use all means possible to secure at least one new subscriber each month, and our slogan shall be "1,800 telephones on January 1, 1916."

Signed: H. P. Myers, Helen Butts, Mattie Backus, C. B. Summers, Geo. B. Miller, J. C. Pride, Jack Richardson, Owen Caswell, C. N. Cook, J. N. Eddy, Arch Isbell, Doris Duncan, Mary Jones, Ethel Kimbro, Pernie Smutherman, Mabel McGinnis, Zilpah Kirby, Marie Roberts, Maggie Sullivan, Stella McGinnis, Nellie Still, Grace Sharer, R. T. Main, Katie Main, Ina Rives, R. C. Tuck, Mrs. House.

Back in the Field

AFTER an absence of thirteen years, during which time the art of telephony made rapid strides in improvement, Mrs. Bessie Lewis re-entered the employ of the Union Telephone Company at Owosso. The first day she was at a loss to understand the improved and scientific methods that had been introduced. The light signals in place of the drop; the increase in the number of operators from six to twenty-five; the number of subscribers from four hundred to two thousand, were marvelous to her. The assistance of the adjoining operator in unravelling and explaining the mysterious methods was greatly appreciated and will ever remain in her memory. The inspiration received from the ease with which the business was dispatched gave her the incentive to endeavor to become an expert. Realizing that it was up to her to become modernized in the new methods, she soon applied herself with a resolution to make good. Her efforts were recognized and she was promoted to the position of supervisor. The management observed her executive ability. Her success as supervisor was assured on account of her ability to obtain the cooperation and team work from the operators, and when the vacancy occurred in the chief operator's position she was the natural candidate on account of her fitness and earnest desire to render the public and her employers service.

She studies very carefully the operating methods of her operators and has introduced such ideas that stimulate their desire to render service, always ready to entertain any suggestion that will work to the mutual advantage of the operating staff and her employers.

The August number of the *Western Electric News* was Eastland Memorial Number. The entire issue was devoted to the history and records of the terrible picnic disaster of July 24. The number of Hawthorne employes killed in the capsize of the Eastland is given as 468.

La Compania Telephonica Mexicana

A Story from the Mountain States Monitor About the Mexican T. & T.

BY W. B. BEVERIDGE

MEXICO is founded on a constitution patterned after ours, and gives liberty and equal rights as does ours—but only to a few. That given to the majority is spelled with small, and in many cases invisible, letters. The country has everything to prosper on, including mines, large ranches or haciendas, both cattle and farming and large industries of all kinds, etc., and in addition to these they have public service systems equal to those found in the other countries of the globe. These were all installed and placed in service during the regime of President Diaz, who did all in his power to make his country one of the best in the world. To do this he made the foreigner and foreign capital welcome. It was in this period that the Mexican Telephone & Telegraph Company came into existence, which today is numbered among those that have incurred the heaviest of losses or confiscation.

Received by the Swedish-American Telephone Company.

Gentlemen: With great pleasure I start work acting as Agent as soon this part of my dear Mexico come in back to the prosperus way, but at present time, I am very sorry to say that we are too far away to have setle O. K. all this maldit revolution troubles. The revolutionary peaple has been destroyed all kind Telegraph and Telephone lines anywhere, robbing and brooking off in small peaces the Telephone apartus, and they are continue to do it yet, so at present it is very dangerous to go away of the large citys to build any telephone lines unless loosing the life. All the sense peaple we are very anxius to get peace in badly hurry up as every body we are loosing money in any trade, and we can not make any business. Yours very truly,
GOMES FARIAS, Coixtlahuaca, Oaxaca, Mexico.

The Mexican Telephone & Telegraph Company, or, as it is known in Mexico, "La Compania Telefonica y Telegrafica Mexicana," is an American corporation with its head offices in Boston. While it is called an American corporation, it numbers stockholders among many nationalities, chief of which are the Mexicans. The company came into existence about 1883, operating under a concession given by the government. From the day of its inception it has always had the same policy in regard to the employes, and that is to have all except the higher officials Mexicans. There have been occasions when it was necessary to deviate from this practice, but in general the rule has been followed. In general the organization of the company follows three columns, but they have different duties from the three-column organization of the companies in this country. The branches are, financial, commercial and plant.

The first handles affairs relating to the finances, the second to the political, traffic and managers of the various exchanges, the third to the engineering, purchasing and the plant in general. All of these departments report to the vice-president. The rest of the organization is the same as is found in the companies in this country.

While not covering the entire Republic of Mexico, the company has exchanges from Monterey on the north to Progreso, Yucatan, on the south and from Vera Cruz on the east to Guadalajara on the west, there being twenty-two exchanges in all. Of these Neri office in Mexico City is the largest and Vera Cruz the smallest. As is natural, according to the development of the country, the most of the exchanges are found in the Federal District (our District of Columbia), where there are ten exchanges, two of which are in Mexico City proper, "Neri" and "Juarez," the balance being in the suburban towns. These exchanges are not connected by toll lines, as are the offices in this country, but are isolated with two exceptions. These are two short toll lines connecting Mexico City with two private exchanges, neither of which is over sixty miles long.

Left—Tubular Steel Pole Destroyed by Shells. Right—Result of a Battle in the City.

The reason why these exchanges are not connected is very clear when it is known that the government owns and operates the telegraph lines all over the republic, and naturally does not care for competition. According to the laws, there can be no monopolies, but all things change when the government is concerned, consequently it is impossible to secure a concession to compete with it. There is a possibility that some future government will grant this concession, and if so, all cities will be able to talk with each other; but this will be in the years to come.

The buildings, plant construction and equipment used vary from the most up-to-date to that used in the Dark Ages, with systems to correspond. While it is possible to change to and install the latest apparatus and to use the latest ideas in the majority of the plants, there are places where it is almost impossible. These are the ones that correspond to our interior block distribution. In order to understand why this is, it is necessary to understand how the towns are built.

The blocks in that country, with the exception of the foreign sections, are constructed or built in one of two ways. The first is where the entire block is built solid, while the second is where there is but one or two homes to a block, with the balance of the ground in gardens. This, however, does not hold good any longer in all cases, because at the present time there is a tendency for the people to build after the American plans. When I say that the block is built solid it means that and nothing else, because the custom there is to build the house around the lot and not to place the house in the center and so waste ground. All is for seclusion, and they secure it without a doubt. The house walls are built to the limit of the ground with the front flush with the sidewalk and the sides and real walls—party walls—without windows or doors. The front has windows and a large carriage door, with the windows barred without exception.

In the center of the lot there is left a space which is uncovered and is called the "patio," or court. Then comes a wide veranda and then the rooms proper, with all the rooms having doors and windows opening onto the patio. In one-story homes the front part is occupied by the family and the rear with the servants' quarters and the stables, providing the family can afford a carriage. In two-story houses the first floor, in case the owner is a merchant, is occupied with the store and stables, and the second with the residence of the family, but for a private residence the first floor has the stable and servants' quarters, while the second is reserved as the family residence.

For this reason it is not surprising to have to go long distances in some cases in order to find the office of some man with whom you wish to do business. In cases where there are only one or two homes to a block you will always find the block surrounded with a wall and the gate guarded by a porter.

A good many of the telephone offices are in this class of buildings, and they answer the purpose nicely in the case of the smaller offices. Where there are only one or two rooms used the balance is occupied by the operator in charge of the office. This is a very good arrangement, as it assures the company of having an operator on hand at all times. The only disagreeable feature of this arrangement is when it becomes necessary to change an operator, for then the place has to be overhauled before the new one will move in. In some cases they are very particular in having everything freshly painted or tinted and the place perfectly clean. It is not always the operator who occupies the balance of the building, for in some of the offices the manager has his home in the part unoccupied by the office equipment. The company has always used the front part of the building for the central office and the office of the manager, so it can be seen that the person occupying the office buildings does not have the best of it. Some of the offices have patios that are kept in the best of condition with flowers and vines, and make very attractive working places and offices.

The latest type of office is of reinforced concrete planned and built after the requirements of the A. T. & T. Company. They are two-story and basement with the operating department on the second floor. They, like the older type buildings, are provided with but one door, for the reason that the average employe has a tendency to think that the company's material is his personal property and can be sold by him for his benefit.

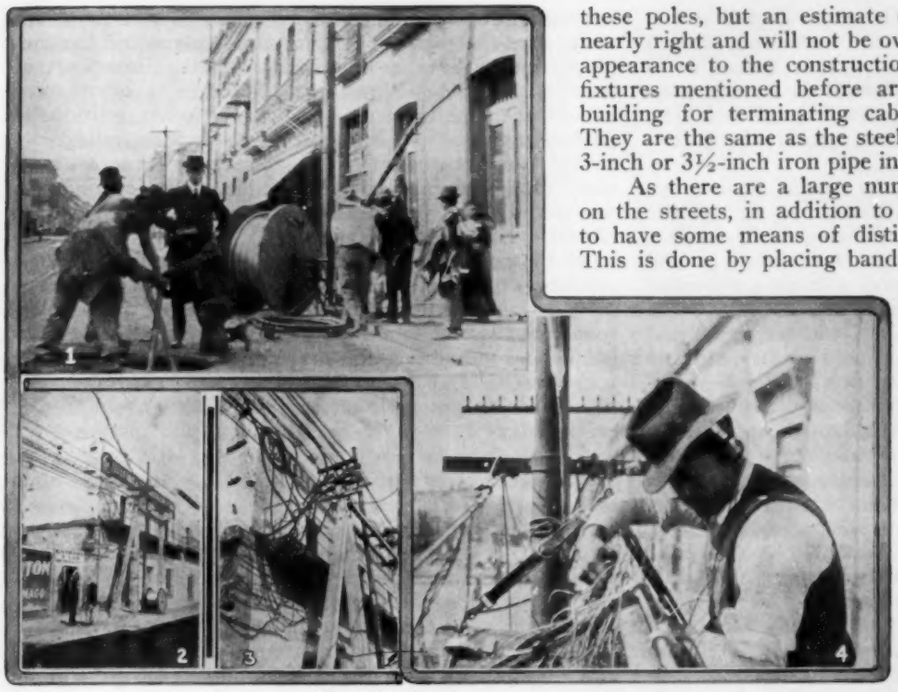
The switchboards, like the buildings, vary, and you can find the latest type No. 1 board or a type that has been obsolete for many years. There are two boards that are freaks in the manner in which the apparatus is assembled or placed, but being magnetos, can be forgiven. One is in operation in the fourth largest office and is what I call the "bleacher" board, on account of the drops being mounted in steps so that they resemble a bleacher stand, the balance of the apparatus being mounted standard. The second is the double key shelf board. The part of the shelf nearest the board has the cords, then comes a space in which the drops are mounted (the drops being below the level of the shelf), then comes a second shelf in which the keys are mounted. Both of these are multiple boards and are giving very good service. The smaller offices have single-position magneto boards using the type No. 3 and No. 19 signals, and are with or without key-shelves as the occasion demands. The frames vary from a single home-made terminal strip to the type No. 4-A frame. These are all in the smaller offices, while in the larger the standard No. 1 board and its corresponding equipment is used. It might be well to say here that the apparatus is Western Electric and the same as is used in this country.

The cable entrances to the offices vary and are sights in some of the places. In the smaller offices the only cable is from the roof fixture to the frame. It terminates in the fixture in several ways, but the most common is to use bridle wire, which serves a double purpose—that of a pot-head and as bridle wires. The roof fixture is generally four-sided so as to take wires from all directions. The supports are four-by-four lumber or larger and have cross-arms placed on the four sides, making a box or crate.

This does not look bad with a few wires and arms, but when there are a hundred or more circuits entering, it begins to look like a spider's web. From this office fixture the wires feed to all parts of the city and use all kinds of supports to get there. This system is used only in the older exchanges, while the newer and more up-to-date use the best of construction. As I said before, the wires use all kinds of supports between the office and the subscriber's station, but the most common are roof fixtures called "jirones" or "rooster feet." They are no more or less than a piece of 2x4-inch or 4x4-inch lumber with a cross-piece or base for setting them on the roofs or walls and a cross-arm. These arms are made of 2x4-inch lumber for the smaller and the standard (Mexican company) ten-pin eight-foot arm for the larger. The smallest arms use the No. 4 type knob for insulators. Wherever possible wood poles are used, but the majority of the supports in exchanges outside of Mexico City are these jirones. The length of spans used and the routes followed naturally depend on the location of the supports, and in some cases the line is anything but straight. Another point that has a great deal to do with this is the securing of right-of-ways for the placing of the supports with the longest time limit possible. Unless it is possible to secure a good contract with all points in favor of the owner, the supports may be moved several times a year. This is being done away with now, as the fixtures for cable are only being placed in the locations where it is possible to secure a contract for at least three years; the others (small jirones) only where necessary to give a clearance above a roof. The usual price for a right-of-way for these fixtures is a free telephone for the life of the contract.

Pole Lead Down in One of Mexico City Suburbs.

In the later exchanges and in Mexico City the con-



SCENES IN MONTEREY.

1—Replacing Two 200-Foot Laterals. 2—Front View of Old Building, 1912. 3—Cables Entering Old Building, 1912. 4—Repairing Cables on Calle Bucareli After a Battle.

these poles, but an estimate of from thirty to forty will be nearly right and will not be overloading or giving an unsightly appearance to the construction. The steel cable distributing fixtures mentioned before are for use on the roofs of the building for terminating cable and to carry the terminals. They are the same as the steel poles in all respects, only using 3-inch or 3½-inch iron pipe in place of the pole.

As there are a large number of companies having poles on the streets, in addition to the government, it is necessary to have some means of distinguishing the different owners. This is done by placing bands of different colors around the pole at a height of eight or ten feet from the ground. The color is assigned by the government and must be placed on all poles set. The color for the Mexican Telephone Company is red; the opposition company is yellow—light blue—yellow and so on for the other companies. This is a big help in places where there are a large number of poles, as the ownership can be recognized at a glance.

In the cable plant the construction, with a few exceptions, follows the standard methods. The principal variation is the placing of the underground terminal at the top of a 45-foot steel pole. Why this is done I could never understand nor receive a good explanation, and I was always trying to secure the lowering to a more reasonable height. In general, the type No. 18 protected can terminal is used for terminals on street leads in order to protect all of the cable from foreign currents caused by crosses. On roofs the type No. 8 terminal is used, as there is very little danger of the lines coming in contact with power or light wires. The cable is hung with Matthew's cable clips, as the marline hangers have too short a life and the rings present difficulties that cannot be overcome at present, but they will be the hangers there as here, in the course of time.

struction is of the best and is permanently located with the exception of the fixtures mentioned above. The plants in the central sections are mostly underground, and in the best residence sections and sections designated in the concessions, the poles are steel. It is the intention of the company to replace all of its wood pole leads with these steel poles in order to do away with replacements, which are frequent. In a great many sections the life of an untreated wood pole is only a trifle over three years and in some cases not over two. With a treated pole, using hot Carbolineum applied with a brush, the life is increased but will hardly run over six years, with an average of five years. From this it can be seen why the steel poles are economical even with the first cost eight times that of wood poles. The steel poles are of two sizes, although a new size has been ordered but not used up to the present; these are 35 feet and 45 feet; the new ones will be 65 feet. The first of these poles used were of lattice construction and at present are tubular. They have a shell three-eighths inch and one-half inch in thickness, with an additional reinforcing band one-half inch in thickness and two feet long at the ground line, in order to prevent corrosion to the pole proper. A lead of these poles when completed presents a very neat appearance, being painted black with a red designation band. The new poles (65-foot) are intended for use as tower poles and will each distribute to four blocks. The fittings of these poles will be the same as the new type roof distributing fixtures, and that is, all steel. The arms will be made of angle iron either 2½x2½-inch or 3x3-inch and 8 feet long fastened with "U" bolts, the arms being provided with break irons that carry two steel pins, giving twenty pins to the arm. For insulators a double-groove type will be used in order to use the No. 17 copper-steel twisted pair wire. It is not possible to give the exact number of circuits that will feed from each of

For some reason or other there is more foreign current leakage or electrolysis in Mexico than I have ever seen elsewhere, and keeps the plant force on a continual lookout in order to keep the points of danger clear. In several locations it was necessary to install the reversing relay provided for taking care of points where the foreign current is subjected to change in polarity, and it has proved very satisfactory. In order to protect the aerial cables, a strain insulator or circuit breaker is placed in the messenger near the underground pole and the underground lateral insulated with rubber tubing where it might come in contact with the pole. In fact, this electrolysis is one of the points that gives more trouble than all of the others, and if not watched continually would soon destroy the entire underground plant. After considerable experimenting, covering a good many years, the following protection was adopted and is placed in the majority of manholes and is only varied from in exceptional cases. The cable is connected to the manhole frame supporting beams (for the frame) to the ground and to the street railway rails, and without exception is provided with a fuse varying from 60 to 100 amperes in capacity. In addition to this, where possible, a ground

wire of at least No. 0000 B. & S. gauge copper is run to the power plant and connected with the station ground. Even with these precautions it is impossible to clear the cables in some localities of all the foreign current, making it necessary to keep a continual watch on the cables. The surveys are taken monthly in all exchanges.

The type of construction used by the Ericsson or opposition company is in the main similar to that of the Mexican Company, the difference being in the cable, drop and general distribution work. In the underground plant they use large size ducts and a large number of small cables, the majority of which are 10 pairs. On the house tops they use small cables and terminals and then run to the subscriber's station with a one pair lead covered cable. This gives construction of the best appearance possible, but is not good from a maintenance standpoint, as it is almost impossible to locate trouble. The majority of cases in these small cables, one pair, are cleared by replacing the cable. The drop distribution is made from tower poles ranging from 40 feet to 70 feet in height. These are provided with steel arms, pins, etc., and care for from four to sixteen blocks. The drop is of No. 16 gauge bronze wire and is often several hundred feet in length. In general, the construction of this company is of the highest order and no expense is spared in order to keep it in the best of condition.

The interior wiring of the Mexican company is placed with No. 20 twisted pair, 500 megohm wire, with a white covering for the larger exchanges, employing metallic circuits, and No. 18 gauge single copper wire with a waxed cotton insulation for the smaller offices, using grounded circuits. Grounds are placed with this single wire and also with No. 14 bare iron wire attached to a ½-inch rod thirty inches in length. The wire in all but the rarest exceptions is supported on small knobs and is kept clear in all possible contact with the walls of the building. This also applies to the instrument which is mounted on wood blocks.

In Mexico City there are a large number of private exchanges in use in business houses, hotels and private residences. These are of two kinds—the straight exchange employing either a Type No. 4 board or a cordless board and the inter-communicating or the Type No. 2. The exchanges using the Type No. 4 are in all cases, where the stations number over twelve, provided with individual power plants and storage batteries. These are made up of the No. 43 electrolytic rectifier and double set of batteries using the Type "CT" cells. In the smaller ones Fuller batteries are used. The ringing current is supplied by a hand-generator except in about five places, when the 115-volt light current is used. These branches run from the ones with four stations to some that have nearly 200 stations. The largest places are not many, as they number the hotels and apartment houses and which in the latter case are mostly provided with four-party service at a special rate. In the apartments that have this class of service the telephone goes with the apartment, with the rental paid by the owner, who includes it in the rent of the apartment.

The employes are, as said before, all Mexicans, and are of all classes, the lower or "peon" class being used for the rough and plant work and for porters and all classes of work not requiring education. The operators are, with but a few exceptions, girls, and compare in giving service with the American operators. They and all the employes in the higher positions are bright, intelligent and are very loyal to the company and officials, as has been proven on several occasions. These occasions were ones that demanded nerve on the part of the employes and the greatest of confidence in the company. One occasion was when President Madero was overthrown and when the bullets and shrapnel shells were continually passing over and, in some cases, striking the building.

It is a pleasure after the dealings I have had with some of the Mexican people outside of the company to say that I have yet to see cases where I or any other official received anything but the best and most courteous of treatment from the employes in all the departments. They are, and will always be, people that any person would be proud to number amongst his most personal friends. It is a mistake to say that the Mexican is lazy and to embrace the entire race under this heading, for, personally, I found it the opposite. The one, the peon, that is generally shown and talked about as the original lazy man is the opposite, and will always work and do the best he can if given a chance and good treatment. He is conscientious and bright, and if once shown will never forget. He always prefers to work on "tareas" or by tasks, and will work at top speed for hours in the sun in order to finish; then, after a short rest, is ready to start a new task or to work by the hour. The most faithful of all is the pure-blooded Indian or Aztec.

In the work on underground in Mexico City these Aztecs are employed in preference to the city laborers and have proven the best. The handling of them is done through a chief who is called "cabo" or "capitan," and who deals directly with the men. If you wish to give an order, hire or discharge one of these men, it is necessary to take it up with the capitan, and he in turn gives the orders to the men. In case this is not done the entire gang may quit. In addition to this, these men will not eat the food of the city and insist that it be brought from their homes. This is done by having one man—paid by the company—in the village from which they come, whose duty it is to collect the food from the various homes and place it on a certain train. Then another man in the city meets the train and takes care of the food for the entire crew. This means work when the gang numbers 200 or more men. On pay days, every Saturday, these men secure their money and immediately start for home, spending very little of their money in the city. On Monday they are all back, or it may be a new crew that returns, but the work goes on as before.

The day of the old Mexico has gone and will never return in any sense of the word. What is more, the present rulers or chiefs that are called generals have stirred up one mess that they nor any other person will be able to control. In fact, this will be the winning faction and means trouble for all the large property owners and firms in Mexico, not only today, but forever. This faction is the so-called "Casa de Obreros," or the Federation of Labor. This is not an organization like those in this country, but is one started by the Carranza faction in order to secure the sympathies of the working people and thereby gain supporters and recruits for his army. It has in the short time it has been in existence gained control in some sections of the country and is anarchy pure and simple today.

How they operate can best be illustrated by the way the Mexican Telephone & Telegraph Company and others were treated and of which I have actual and personal knowledge. During the start of the Carranza regime orders were sent out for a strike in two companies, and when their demands, which were unreasonable in all points, were refused the companies were confiscated by

order of the government. As the telephone company was one of the largest in the country, I expected it to be the next, and returned to Mexico City in order to be on the ground when its turn came. It was delayed, but in January the company was presented with a "manifesto" or list of the employes' demands. These were as unreasonable as the ones presented to the other companies, but the company saw the justice in some of the demands and agreed to grant them, but refused to grant all. This ran along until General Obregon came to the city and then the climax came. The representatives of the company were told to appear before the city council, together with the representatives of the strikers. When they had all assembled the representatives of the company were asked "if they would grant all of the demands." When they answered, "No, we will do what we have offered, but cannot grant all of the demands, as they would cause irreparable damage to the company." Then a representative of the Carranza government said, "In that case, I declare the company confiscated in the name of the revolution." This was done and the company was turned over to the strikers to operate, which at the same time severed my connection with the same. Today, as far as I can learn, the company is still under the control of these people, and will never be returned until such a time as Mexico has a government. But one thing will be true, and that is, when it is returned it will have to be rebuilt and many pieces of apparatus replaced, as the present operators cannot secure material of any kind to keep it in operating condition for any length of time.

Invitation to San Diego

Editor TELEPHONE ENGINEER—Will you kindly permit me to utilize the columns of the TELEPHONE ENGINEER to extend a cordial, fraternal invitation to all those attending the convention of the Independent Telephone Association in October to visit San Diego and its Panama-California Exposition, and thereby make their western trip complete?

California has extended herself mightily during 1915. Barring the great European war, she has been the center of world-wide interest. The Panama Canal brings the world to our doors. In honor to history's greatest engineering feat and commercial accomplishment, the California Expositions have spent millions to entertain the nation and to show you what California has to offer.

I heartily endorse the judgment of the Independent Telephone Association in selecting San Francisco, instead of some eastern city, for the 1915 convention. But a western itinerary which omits San Diego is like touring Egypt without seeing the pyramids! Where San Francisco has spent many millions, San Diego has invested several; while the northern fair is an exhaustive display of indefinite scope, the southern Exposition is a finished achievement of landscape perfection and architectural consistency; the Panama-Pacific is a blaze of glory—the Panama-California a perfect gem. After being fed up on real meat at the convention, you will relish this southern treat as the dainty dessert to fittingly finish your western repast. Come!

You know what a California welcome is—what southern hospitality means—we combine them in San Diego! We want you here; San Diego wants you; the Chamber of Commerce urges you; the Home Telephone Company insists upon your visit. Incidentally, I think you will find matters of particular interest to Independent telephoners upon which to focus your attention here. Our city has doubled its population in four years. Our home-owned Independent company is keeping abreast of the times. To enhance the inducements which our complete automatic plant offers to "Homephone" users, we have recently inaugurated a revolutionary co-operative policy. This plan provides for a rebate to subscribers of all profits earned by the company in excess of three per cent on the capital stock. This automatically regulates the rates and insures the subscriber the best of service, as there is no temptation to slight service for profits, as is the case when a public service corporation is operated solely for profit, especially where there is no competition.

While this is a marked departure from traditional telephone administration, the experiment is proving successful as the fairness of the proposition is not only bringing us many new subscribers, but is attracting favorable attention throughout the country.

With promises of the biggest welcome which San Diego, the Exposition and the Home Telephone Company can offer when you come to us in October, I remain, yours very cordially,

CHARLES E. SUMNER,
President San Diego Home Telephone Co.

San Francisco to Have One System

The Pacific Telephone & Telegraph Company was recently authorized to purchase the franchise of the Home Telephone & Telegraph Company within the city of San Francisco. The present franchise of the Pacific company will expire in 1940, while the Home company franchise, which it will acquire, will expire 16 years later.

Under the terms of the compromise, whereby the transfer was first sanctioned by the supervisors and approved by Mayor Rolph, the city agrees to dismiss the appeal now pending before the Supreme Court involving the right of the companies to transfer the properties. The Pacific company will be required to pay to the city and county of San Francisco 2 per cent of its gross receipts from the Home system in use (approximately $3,000), and to furnish 1,000 telephones to the city of San Francisco. The Pacific company has heretofore not been required to pay to the city any portion of its gross receipts, but it has allowed the city the use of approximately 600 free telephones. It will convey back to the city the old Pacific company franchise.

The commission says in the opinion that it has considered certain actions of the supervisors in 1906, when they granted the Home franchise, but "these matters happened nine years ago. The present supervisors had full knowledge of this and concluded the best interests of the city required the consummation of the arrangement. On the facts of the case we hesitate to substitute our judgment for theirs and to withhold our approval to the compromise arrangement which they, with much care and thought, have entered into."

British Automatic Making Marksmen

Besides making automatic telephone equipment, the Automatic Telephone Manufacturing Company, Ltd., of Liverpool, has turned out 300 marksmen during the past year, according to an article in the Liverpool *Echo*, which reads:

At the indoor range at the Automatic Telephone Manufacturing Company's works off Edge-lane, Liverpool, a large number of rifle-shooting enthusiasts assembled at the prize distribution meeting, when James W. Taylor, the chairman of the company, distributed prizes, including twelve gold medals and a shield, to the winners and runners-up in the works league.

Mr. Broker, the general manager, said that at the outbreak of war it was decided to form a rifle club for the employes and staff. Temporary accommodation was fixed up within twenty-four hours out of doors near Tournament Hall, and this was continued while the fine weather lasted, during which time an indoor range was being constructed in a wing of one of the factory buildings. The club had up to date turned out no fewer than 300 really good shots.

The New York Telephone Company will co-operate with the police department in the capture of criminals under a new arrangement.

Territory within 100 miles of New York has been divided into seven zones. As soon as the police notify the telephone company descriptions of criminals sought by the police will be flashed in a few minutes to all chiefs of police, sheriffs, constables and railroad station agents.

Public Utility Commission News

Reports Concerning the Activities of State Regulating Bodies in the Telephone Field

New York

NEW YORK State Public Service Commission has decided the long pending case of the board of supervisors of Orleans county and the trustees of Albion against the New York Telephone Company as to increase of rates. The commission finds that careful study of the elaborate inventory and appraisal, and the figures for the business done in the area affected, justifies the increases whereby two-party business lines were raised from $24 to $30 per annum and four-party residence service from $12 to $15 per annum.

The increases were made in 1911 and the complaint filed in July of that year. It resulted in one of the most elaborate valuation records which has come before the commission. Numerous hearings were held and over a thousand pages of testimony taken. The value arrived at after inventory and appraisal was based somewhat on the testimony of the company's experts and it was not proven that some of the amounts were actually expended. But, as a further check on the tangible value of the telephone property in service in Albion figures were introduced to show the reproduction cost of the plant as of December 31, 1912, based on actual bids received for the material required plus the expense of installing the same. The amount of this estimated cost was $276,400, which was checked by the commission's engineers and found to be substantially correct. The depreciation items were also closely scrutinized by the commission's engineers and approved.

Michigan

Citizens of St. Joseph and Branch counties are indignant over the recent action of the Michigan State Railroad Commission, in granting the Southern Michigan Telephone Company an increase in rates.

It is said this will result in the subscribers ordering their telephones removed.

The company, after merging several of the smaller systems in these two counties, went before the commission asking that it be given permission to raise its rates as it had property and investment amounting to $1,100,000 and that in order to realize enough to allow 5 per cent for depreciation and 6 per cent for dividends, the rates must be increased.

The tax commission assessed the property at $425,000 and the remonstrators contend that this, being a fair and equitable appraisal of the property, should bring enough revenue to realize the 5 per cent for depreciation.

Appraisal of the lines of the Michigan State Telephone Company in Detroit, asked by the city as a result of the company's request for permission to increase rates, will be done by the State Railroad Commission, according to a ruling received.

The state will bear the expense of the apprasial.

The city may, if it wishes, employ appraisers of its own and bear the expense of their work, although the state commission intimates that such a course will not be necessary except in the event of a disagreement between the commission and city officials as to the accuracy of the work done by the state appraisers.

The commission's ruling came as a result of the city's request for permission to name the Detroit Trust Company and Engineer Burch of the firm of Barclay Parsons & Klapp of New York, now engaged by the board of street railway commissioners, as appraisers for the city. The city, to avoid delay in completion of the work, offered to pay for the appraisal.

The ruling does not state when work on the appraisal will be started.

The findings of the commission's appraisers would be final except upon proper showing of error by the city's experts, according to the commission's statement.

An order has been issued by the State Railroad Commission authorizing the Southern Michigan Telephone Company to increase its rates for toll service in Lansing.

Tennessee

Representatives of the Automatic Telephone Company of Nashville, have requested that the public hearing to be given them at the commission meeting be postponed until some later meeting of the commission. It was explained that a gathering of the stockholders of the company would be held and that the representatives of the company wished to know the desires of these stockholders on all matters before making any definite move before the city commission.

The bill granting a franchise to the Automatic Telephone Company has passed two readings before the city commission. It is a requirement of the law that all franchise bills must lie over ninety days between passage on second reading and final reading. The bill was passed on second reading early in June, and was then referred to a committee. Of this committee only Commisisoner Alexander remains on the present board. The bill will come up on third and final reading at the first meeting of the commission in September.

The Tennessee State Railroad Commission is beginning to receive exceptions to the assessments on telegraph and telephone property throughout the state. All these exceptions must be before the commission by August 10 and the assessment must be certified by the board of equalization by the first Monday in September.

The hearings on exceptions are progressing and the commission hopes to conclude such hearings by August 15.

Wisconsin

The Deerfield Telephone Company and the Kegonsa Independent Telephone Company, operating in the southeastern part of Dane county, were authorized by the Wisconsin State Commission to charge a toll rate of 5 cents for every message passing over the lines connecting their exchanges.

The Random Lake Telephone Company and the Washington County Telephone Company were authorized to increase rates 20 per cent.

Milwaukee is entitled to a substantial reduction in telephone rates, conceding that the Wisconsin Telephone Company is entitled to a fair return on the real value of its property used in the public service.

This claim is made in a brief filed with the commission on behalf of Milwaukee.

In August, 1910, Milwaukee filed a complaint with the commission, alleging that telephone rates in Wisconsin were excessive. Discrimination in contracts was alleged. An investigation was made by the commission and a hearing held in June, five days being taken up with hearing of witnesses. Milwaukee requests that suspicious scrutiny should be exercised by the commission in investigating the relations of the A. T. and T. Company with the Wisconsin company and the Western Electric. If possible, a simultaneous investigation of all three companies should be made. The profits of the Wisconsin company should not be juggled between these companies to hide them for rate making purposes.

A comparison of telephone rates in Milwaukee with cities in America similarly situated is made, showing the Milwaukee rate too high.

A comparison of continental telephone rates under public ownership shows American rates are excessive.

A universal, unlimited telephone rate for all, without discrimination, is suggested as preferable to a differentiated flat rate, metered or measured rate.

Illinois

At a hearing before the Illinois State Public Utilities Commission, at Springfield, a compromise was effected between the Noble Telephone Company and the Noble Mutual Company, by which the former is to keep its present lines outside the corporation of Noble and the latter inside the corporation, but that the Mutual company is to restrain itself henceforth to operations outside the corporation.

This compromise marks the end of a long period of litigation, and has been taken as a test case by the state utilities commission. The case began in May 5, 1914, when the Noble company obtained an injunction from the commission against the Mutual company for operating without a certificate. The injunction was upheld by the Sangamon county circuit court, and in an appeal, by the supreme court. The Mutual company applied for a certificate and the Noble company protested this before the commission, on the grounds that they had been the first company to operate within the corporation. The compromise brings to a close the dispute.

Announcement was made at Peoria of the decision of the Illinois Utilities Commission to extend the time for appraisal of the properties of the Central Union Telephone Company of Peoria. The time originally set expired three months ago, but an extension of ninety days was granted. The officers of the company applied for a further extension, and time was granted to December 5.

The appraisal is being made under ruling of the commission in the case of the City of Peoria, which is seeking to have telephone rates lowered. It includes all poles, wires, switchboards, instruments and all apparatus and appurtenances. Eighteen men are being used by the company in the inventory, and appraisal and all figures are being checked by the engineering department of the utilities commission.

Kansas

The Kansas State Utilities Commission has started work in Hutchinson on six cases which are set for hearing.

The complaint of the Jetmore Telephone Company who seeks to connect its toll lines with the Hansen exchange was heard, as well as applications from two new companies, the Hansen Telephone Company and the Radium Telephone Company, for permission to transact business in the state.

No decisions have been given out by the commission.

California

In accordance with the plan outlined by its executive committee in submitting a program of activities for the fiscal year 1915-16, the Mission Promotion Association of San Francisco, has decided to initiate a vigorous campaign for betterments which will be of great benefit not only to the Mission district, but to all San Francisco.

Three of the proposed improvements are of especial interest. These are, first, the general reduction of telephone rates and the betterment of telephone service; scond, a general reduction of fire insurance rates throughout the city; third, the obtaining of a sufficient appropriation to realize the widening and improving of the Bernal cut.

After considerable investigation the association has learned that the local telephone rates are much higher than those of eastern cities of the same population. Invariably San Francisco's rates are from two to three times higher for similar service and similar facilities. The association has therefore appointed a committee to bring the matter to the attention of the commission, which has plenary power to regulate the rates and service of all public utilities.

Ohio

Elimination of competition in Marietta Telephone circles is arousing more interest in outside localities than in Marietta, according to letters which have been received at the office of the utilities commission in Columbus, which must approve any merger of the Marietta plants. While the commission has received one or two inquiries as to a rumored advance in rates resultant from the merger no formal protest has been lodged against this consolidation.

Missouri

Complaint against the Southwestern Telephone and Telegraph Company, filed with the Missouri Public Service Commission, has been decided in favor of the telephone company.

The evidence in the case was heard by Judge Hugh McQuillan, member of the commission, May 13, and has since been taken up by the entire body.

At the hearing the following points were brought out as the basis for the complaint:

At the time the Miller Township Company sold its Hannibal franchise and exchange to the Equitable Construction Company in 1902, it was said the latter company agreed as a part of the consideration to furnish the stockholders of the Miller Township Company, residing in Hannibal, free or prepaid telephone service during the life of that company's franchise, or until April, 1921. It was considered that this contract was binding to successors of the Equitable Construction Company.

It was stated at the hearing that such service had been rendered until September, 1914, when the Southwestern Telephone and Telegraph Company served notice on the complainants that such service would be discontinued, unless they signed contracts for telephone service in which they would agree to pay certain rental charges. Thereupon proceedings were started before the public service commission.

Colorado

The Mountain States Telephone & Telegraph Company has been supplied with forms by the Colorado State Public Utilities Commission which, when filled out, will furnish the commission with a complete inventory of the company's entire equipment for its system throughout the state.

The inventory is being made preparatory to a hearing which will be held on January 3 when the attorneys for the company must appear before the state commission to justify its present schedule of rates, its rules and regulations.

After receiving the completed forms, which were drawn by Engineer Rankin of the commission, a check of the inventory will be made by representatives of the commission.

Kentucky

The mayor and city council of Marion, after having tried for many months to compel the connecting up and usage of toll wires through the exchange office of the Central Home and Telegraph Company, and the Cumberland Telephone and Telegraph Company, have filed a complaint with the commission, setting out the reason why such connection is desired.

Pennsylvania

When the three-year-old controversy between the Pennsylvania Public Service Commission and the telephone companies of the state as to the reasonableness of the rates the commission proposes to enforce has come before the public service body. Jones, counsel for the Keystone Telephone Company of Philadelphia, questioned the right of the commission to make rates. He said the law provides only for the supervision and correction of public service companies doing business in Pennsylvania and when the commission attempted to formulate an entirely new rate it usurped the right of the companies.

Commissioner Pennypacker questioned Mr. Jones at some length as to his reasons for this assertion and then called his attention to the fact that the commission had not hesitated to step in where proposed rates had been regarded as unfair or excessive and asked him if this did not in effect go back to the proposition of establishing new rates.

Mr. Jones charged that the method by which the commission proposes to fix the telephone charges for the state is basically wrong. He said the only fair way to arrive at a proper conclusion in the matter would be by an examination of each company separately and that population, upon which the tentative schedule is founded, plays only a small part in the fixing of telephone rates.

The hearing is one of the most important ever given by the commission. Any of the telephone companies interested may protest, even though they have had no part on the proceedings leading up to the present argument. All the telephone companies are opposed to the proposed schedule.

Minnesota

The Minnesota State Railway and Warehouse Commission has refused the petition of the Northwestern Telephone Exchange Company to compel the Minnesota State Telephone Company to ask a permit before beginning operations in Brainerd. The Minnesota Telephone Company has a franchise, granted by the Brainerd council and this the commission held was sufficient.

On June 13, the Minnesota State Telephone Company petitioned the Brainerd council for a franchise to operate in that village. It was duly granted and the company, in order to evade the new telephone control law which went into effect July 1, strung temporary wires on poles belonging to the city water department and installed a few telephones.

The Northwestern Exchange Company, which has a plant in Brainerd, declared this was an evasion of the new law and demanded the company be compelled to seek a permit from the commission as required by the new control act. The commission in denying the petition ruled that the franchise granted the company by the city was in the nature of a contract and that it could not be violated by the state as it had been granted before the control act came into effect.

The State Railroad and Warehouse Commission cannot compel telephone companies to make a physical connection of local lines within the same town, according to the answer of the commission.

The toll companies may be required to connect their lines and local companies with outside toll lines, but the provision in the vetoed Minnette bill of 1913 for compulsory connection of local lines was omitted from the Minnette measure passed by the recent legislature.

The first formal hearing before the State Railway and Warehouse Commission, the application of a telephone company for an indeterminate permit to operate its system within a municipality provided by the Minnette law, was held at Thief River Falls before the commission, The city of Thief River Falls objected to the issuance of such a permit on the grounds that the commission has not jurisdiction, this being the case in which the Tri-State Telephone Company making application, is now operating its exchange, although without a franchise or permit.

The railroad and warehouse commission is without power to compel telephone companies in the same town to make physical connections between the two systems, no matter how desirable such an arrangement might be to the citizens. This is the answer of the commissioner to J. B. Ries of Shakopee.

Mr. Elmquist explains that the commission can compel a telephone exchange to connect with a toll line, a toll line to connect with a city exchange and to require two toll lines to join the service when the public convenience or necessity demands and the order will not do irreparable injury to either concern, but two telephone companies in the same city cannot be forced to do business with each other.

The original Minnette bill, as introduced in the 1911 and 1913 sessions, contained such a provision, but the author decided not to champion it in the 1915 measure, which became law.

Wyoming

The Wyoming Public Service Commission has issued a certificate of necessity to the Rockyford Telephone Company granting full permission to maintain and use a 35-mile telephone line between Sundance and Beulah, Wyo., and a branch line on the Rifle Pit divide in Crook county. This action was taken after a personal trip of inspection to the field made by Secretary H. Allen Floyd, who returned the report that the Bell Fourche & Northern Telephone Company, which firm has parallel lines between the same communities was no longer operating and that the service between the two communities was entirely inadequate. He found that in

many places the telephone wires were strung along barbed wire fences and that in other ways the service was inadequate to the needs.

The Rockyford Telephone Company had constructed its line before applying to the commission. When at last it did apply, the Bell Fourche & Northern filed a protest issuing a certificate on the ground that they had at an earlier date constructed a telephone line between Sundance and Beulah and that to permit the new company to operate would be the eventual ruin of the older line. The matter required a personal investigation with the result that the commission found the system to be inadequate and that no steps were being made to improve it. Consequently a certificate has just been issued granting the newer company permission to enter the field of competition.

West Virginia

The State Public Service Commission of West Virginia, sitting at Charleston, will hold a hearing preliminary to the adoption of new rules and regulations for governing telegraph and telephone companies in West Virginia. At this time the proposed merger of the Bell and Consolidated Telephone systems will be the most important subject discussed as those back of the merger expect to have all opposition now in evidence wiped out.

Clarksburg has been the only city in the state to assert itself in opposition to the merger. The obvious result of such a merger would be better service at more reasonable rates. That there is no selfish interest behind the merger is proven by the fact that the merger was proposed by business men and endorsed by the Board of Trade. The telephone companies stand ready to consolidate at once.

Indiana

An increase in telephone rates in Logansport, Ind., is provided in a decision of the Indiana Public Service Commission granting a petition of the Home Telephone Company, which was filed more than two years ago. The commission found that the old rate was too small to provide a sinking fund for improvements. The changes in five classes of service are as follows: Single residence, from $15 a year to $24; two-party residence, $12 to $21; four-party (new class), $15; single party business, $30 to $36; two-party business, $24 to $30. There is no change in the rates of rural telephones or branch exchanges. The hearing was held last March. The Bell Telephone Company has long distance service in Logansport, but no local lines.

Washington

The appraisal of the telephone lines in Washington by the Public Service Commission is complete, with the exception of the systems of the cities of Seattle and Tacoma. The general appraisal of telephone properties is the first ever attempted in the state of Washington.

The system followed in valuing the telephone properties eliminates equipment duplicated by purchase from one company by another. Only that part of the equipment which is needed to deliver a satisfactory service to the people is tabulated in the commisison's inventories.

Over one-half of the work of valuing the holdings of the Puget Sound Traction, Light & Power Company in Seattle, has been completed. The task is a big one, and it will not be completed for another year because of the lack of funds to employ sufficient men to carry on the work.

Members of the Washington Public Service Commission have been called to account by Governor Lister for expenditures from their "miscellaneous" fund, during the first three months of this biennium, which, if continued, would have practically exhausted this fund by the end of the present calendar year.

Of $172,875 appropriated by the recent legislature for the commission, exclusive of the grain department, $92,875 is set aside for specific purposes, including the salaries of the three members of the commission and ten officers.

The remaining $80,000, in the language of the appropriation, is set aside for "salaries of stenographers, clerk hire and accountants, assistants, witness fees, assistant engineers, traveling expenses, experts, furniture, stationery, postage, office supplies and incidentals."

While expenditures from the specific funds for which $92,875 is appropriated do not exceed the monthly allowance, expenditures from the $80,000 "miscellaneous" fund during the months of April, May and June amounted to $25,515.35. The larger part of the $25,515.35 expended thus far from the miscellaneous fund appears to have been used under the immediate direction of Chairman C. A. Reynolds at the Seattle offices of the commission, where an unusually large engineering force has been engaged in the completion of the valuation of the Bell telephone properties in th entire state, a considerable undertaking.

As soon as the valuation work is completed, the commission announces that the Seattle office will be discontinued, and that the chairman will make his permanent office at Olympia.

Consolidation Planned for Providence

A plan for the consolidation of the Providence Telephone Company with the New England Telephone & Telegraph Company was submitted to the stockholders of the former corporation at Providence. The combination is to be effected by an exchange of stock on the basis of four shares of New England Telephone & Telegraph for five shares of Providence Telephone stock.

In a letter to stockholders, the Industrial Trust Company, which has been appointed as depositary, explains that if on or before November 1, 50,000 shares of the capital stock of the Providence Telephone Company shall have been deposited, the New England Telephone & Telegraph Company shall be under obligations to exchange its stock for the stock deposited on the basis outlined, but if 30,000 shares are deposited the exchange will be at the option of the New England company. A condition of the plan is that several of the directors of the Providence company shall continue as directors of the New England company. Until it is known whether the plan is generally approved by the stockholders of the Providence company no attempts will be made to work out any operating details. No change in rates will be made it is stated.

The par value of the stock of the Providence company is $50, but its present market price is $96. The company pays an 8 per cent dividend and has a surplus of $500,000. The capitalization is $5,000,000.

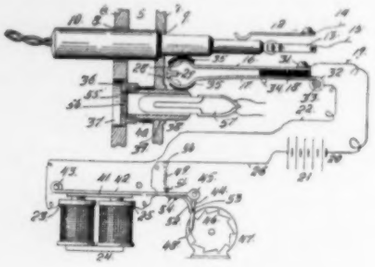
Telephone Patents Issued in August

A Brief Digest of those Current Specifications Most Interesting to Telephone Men

BY DAVID S. HULFISH

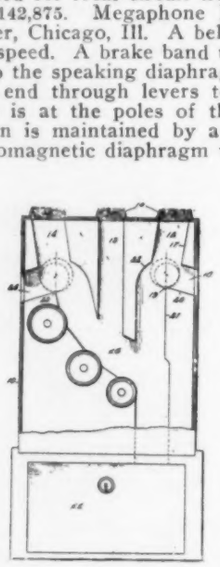
PATENT No. 1,142,804. Telephone Receiver Support. Issued to A. H. Drake, Waterloo, Iowa. An ingenious arrangement of levers upon the column of a desk stand enables the user to draw the receiver to a support position where it will be held convenient to the ear, or to push it into another position where it will be out of the way and at the same time will hold the hook lever down.

1,142,847. Signaling System. Issued to Michisuya Suwa, Tokio, Japan. When the two receivers upon a private line are both hung on their hooks, each station presents to the line wires a bridge containing a bell and a battery, but the two batteries are opposed in potential and are balanced. The lifting of either receiver removes one battery and through the speaking bridge forms a circuit for current from the distant battery to ring the bell of its telephone. When the hooks are up, the bell-ringing batteries, or a portion of them, are used for local circuit transmitter supply.



1,143,140.

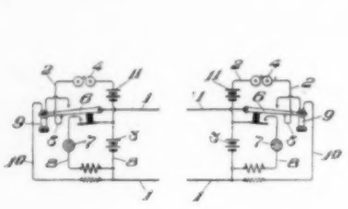
1,142,875. Megaphone Receiver. Issued to Charles K. Cregier, Chicago, Ill. A belt drives a friction drum at a uniform speed. A brake band upon the drum is attached at one end to the speaking diaphragm of the megaphone, and at the other end through levers to an electromagnetic diaphragm which is at the poles of the receiving magnet. A normal friction is maintained by a spring. Any movement of the electromagnetic diaphragm will cause a variation in the friction between the brake band and the moving drum, resulting in an amplified movement of the megaphone diaphragm.



1,143,357.

1,143,140. Call Register Controlling Circuit and Devices. Issued to Jay A. Robinson, Denver, Colo., assignor of parts to A. J. O'Brien and S. J. Boughton. The cap of a signal lamp is arranged as a push button and the meter is operated by pushing directly upon the lamp cap. The lamp is located near the line jack and the contact springs of the push are so controlled from the jack that the meter can be operated only when a plug is in the jack near the push button.

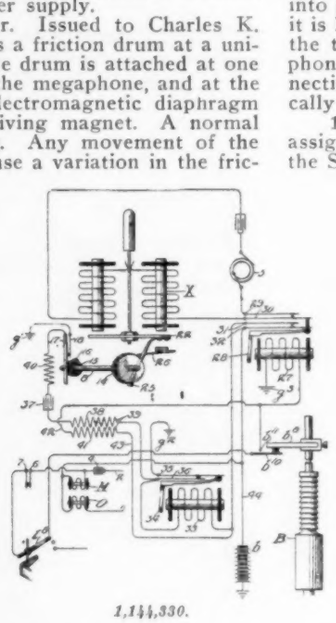
1,143,356 and 1,143,357. Coin Separator and Signal System. Issued to George T. Buchanan, Highland Park, Mich. A telephone toll collecting box for nickels, dimes and quarters has a runway with three gongs. The chute for nickels enters the runway above the lowest gong and each nickel signals "one" by striking the lowest gong. The dime chute enters the runway above the second gong and each dime signals "two" by striking the two gong. The quarter chute enters the runway at the top and each quarter signals "three" by striking the three gong. Coins are separated by striking a point so placed that small coins fall upon one side and are returned to the depositor, while full-sized coins fall upon the other side and pass to the gongs and then to the till.



1,142,857.

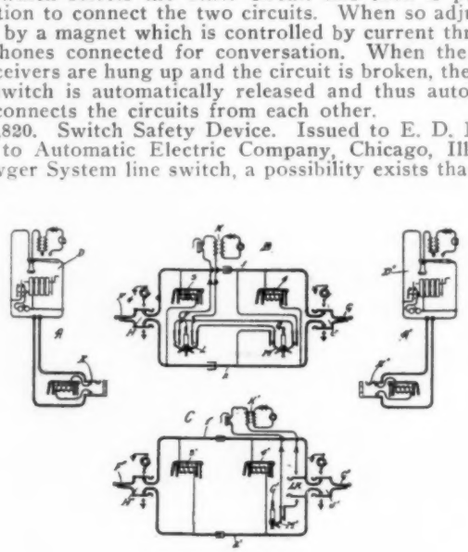
1,143,680. Cordless Switchboard System. Issued to William Aitkin, Liverpool, England. For connecting two circuits, a switch serving one of the circuits is turned to a position which selects the other circuit and then is pushed into position to connect the two circuits. When so adjusted, it is held by a magnet which is controlled by current through the telephones connected for conversation. When the telephone receivers are hung up and the circuit is broken, the connecting switch is automatically released and thus automatically disconnects the circuits from each other.

1,143,820. Switch Safety Device. Issued to E. D. Fales, assignor to Automatic Electric Company, Chicago, Ill. In the Strowger System line switch, a possibility exists that two telephones calling simultaneously may seize the same "first selector" and thus be "doubled" upon the one device. In the system of the present patent to Mr. Fales this event avoided and the two calling telephones are signaled in case such a simultaneous calling is attempted.

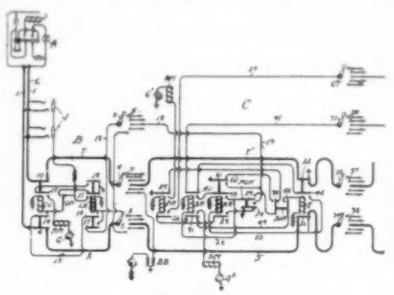


1,144,330.

1,143,983. Insulator Pin. Issued to Charles E. Miller, Pittsburgh, Pa. The top end of the metal has threads and a wire spiral is of such diameter at its ends as to engage the threads upon the metal pin and of such diameter at its middle portion as to engage the internal threads of the ordinary glass insulator.



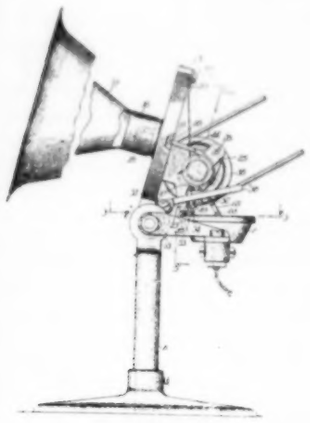
1,144,401.



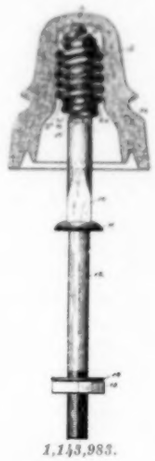
1,144,084.

1,143,998. Line Switch. Issued to John G. Roberts, assignor to Western Electric Company, New York, N. Y. In a bank of sets of spring contacts, horizontal and vertical bars operate the contacts, the arrangement being such that when one horizontal bar and one vertical bar are operated that contact set is operated which is located at the intersection of those bars. Thus one bar selects a group of contact sets and the other bar selects one contact set of that group.

1,044,084. Call Distributing System. Issued to Charles



1,142,875.



1,143,983.

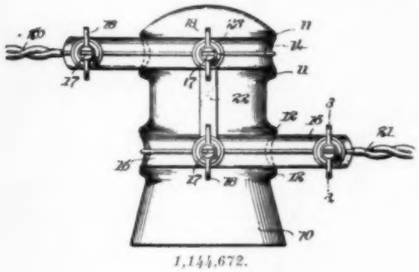
S. Winston, assignor to Kellogg Switchboard and Supply Company, Chicago, Ill. A simple line switch first selects a more elaborate cord selector which then selects an idle cord to serve the call.

1,144,330. Busy Tone Device. Issued to G. E. Kimball, assignor to First Trust and Savings Bank, Trustee, Chicago, Ill. (Filed September 19, 1906.) The slow interruptions of the tone are made by a commutator driven by a pawl in turn driven by an armature propelled by ringing current. The device is operated only when some circuit is closed to require the tone current.

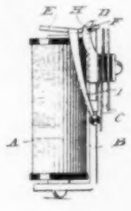
1,144,391. Transmitter. Issued to W. R. Stunz, Lansdowne, Md., assignor to The Webb Talking Pictures Company. A combination of multiple electrodes and a diaphragm electrode having carbon cells on both sides. Adapted for currents of large value.

1,144,401. Magneto Cord Circuit with Secret Service. Issued to R. I. Utter and H. P. Schmidt, assignors to Kellogg Switchboard and Supply Company, Chicago, Ill. The operator cannot listen after the calling plug is lifted from its seat.

1,144,560. Indicating System. Issued to E. C. Molina, assignor to American Telephone and Telegraph Company,



1,144,672.



1,144,745.

New York, N. Y. In a few systems of automatic and semi-automatic telephone working, a line number is displayed upon an indicating device which displays variant numbers for variant adjustments. In the device of the present patent the numbers are displayed according to a decimal system, yet the control is not a decimal system control. Such a system of control may be of value when the final connectors of an automatic system are arranged for more or less than one hundred lines each.

1,144,605. Code Ringing Drop. Issued to Oscar M. Leich, assignor to Cracraft, Leich Electric Company, Genoa, Ill. This is a switchboard drop suitable for farmer lines where a code signal is rung to call the exchange and other code signals are ignored by the exchange operator. The drop shutter always falls on any signal, thus identifying the calling line, and a relay circuit then makes audible the code which is being rung.

1,144,672. Fused Test Insulator. Issued to George Whealy, Meadowbrook, Pa. The line wire is dead-ended in upper and lower grooves of the insulator, and provided with collars having test clamps. A fuse link then may be used to connect the upper and lower collars, completing the line conductor through the fuse.

1,144,745. Relay. Issued to S. E. Witt, assignor to Automatic Electric Company, Chicago, Ill. In a relay of the type using a return pole piece and bell-crank armature mounted upon the end of the pole piece, a pair of spring clips upon the pole piece engage an armature pivot pin to hold the armature in position.

Bell Buys Jersey Competition

The Interstate Telephone Company and the Elizabeth Telephone Company, a subsidiary, both operating in New Jersey, were bought at receiver's sale by J. L. Swayze of Newark, acting for the New York Telephone Company, of which he is general counsel. The approximate price for the entire property, which was sold by parcels, was $60,000, subject to outstanding obligations. The Interstate company has outstanding bonds aggregating $2,231,500, of which $618,750 is covered by a senior mortgage of $1,000,000 and the rest by a junior mortgage of $4,000,000.

The Paterson, Passaic and Suburban Telephone Company, a subsidiary and debtor of the Interstate, will be sold at a receiver's sale. It will also be purchased, according to present plans, by the New York Telephone Company. This will give the Bell system virtual control over all important competing lines in New Jersey. The few independent companies still in existence are for the most part small local concerns operating in rural communities, and most of these have working agreements with the Bell.

The Interstate company operated principally in Trenton, Atlantic City, Camden, Millville, Bridgeton, Bordentown and other municipalities in the southern part of the state. It had also a working agreement with the Keystone company of Pennsylvania, having been organized primarily to compete with the Bell system.

Spokane Independent Sues on Specific Performance

The federal court at Spokane, Wash., decided in favor of the Davenport Independent Telephone Company in the suit brought by it for the specific performance of a contract of sale entered into by it with the Pacific Telephone and Telegraph Company, involving the transfer to the Pacific company at the Davenport company's system, plant and franchises at the price of $34,623.

In the written opinion embodying the decision "The offer of the Pacific company to purchase, the acceptance of the Davenport company, the mutual appraisement, the offer to convey and the refusal to accept conveyance or pay the purchase price, are all admitted. The Pacific company contends the Davenport company has an adequate remedy at law and seeks to justify its refusal to carry out the contract on the following grounds: Because of the Sherman anti-trust act, because of a decree of the United States district court of Oregon in a suit in which the United States was plaintiff and the Pacific company one of the defendants, because of the statute of frauds and because the Davenport company's title is unsatisfactory."

All of these reasons for refusing to carry out the contract of purchase at the agreed price are declared to be invalid.

Of Interest to the Trade

What the Telephone and Accessory Manufacturers Are Doing to Advance the Art

Rapid Fire Drill Improvements

Some years ago we published a description of the "Rapid Fire" drill then placed on the market by the Diamond Expansion Bolt Company, New York. Since that time several new models have been designed and placed on the market and the latest model is shown here.

The success of these drills has been pronounced and it has now become a tool of general utility on all contracts where drilling in brick or concrete is necessary. A number of large electrical, plumbing and steam fitting contractors have practically discontinued the old style hand drilling and are using "Rapid Fire" drills instead with good results.

Floor Stand.

New Rapid Fire Drill.

Among the improved features of the new 1-D model are the adjustment screw for regulating the power of the blow exerted upon the drill and the new extension spring operated over the yoke which straddles the main shaft at the rear of the plunger.

In order to improve the efficiency of the tool when drilling in ceilings or in floors, the Diamond "Rapid Fire" ceiling stand and the Diamond "Rapid Fire" floor stand have been placed on the market.

The ceiling stand is made of telescopic sections easily adjusted to various heights of ceilings and the drill is forced into the hole by means of a powerful spring.

The floor stand is so designed that the operator is conveniently seated on the platform and by a slight forward or backward movement on the platform the drill point is inserted or withdrawn from the hole with a rocker motion. This stand is particularly useful where a great number of holes must be drilled on given centers as in the floors of auditoriums for fastening seats. When the holes are marked the operator can without leaving the seat slide it to different positions on drilling.

Vestibule Telephones

The Connecticut Telephone and Electric Company, Meriden, Conn., has just placed upon the market a new vestibule telephone outfit. This is known as the cordless type. As will be noted from the illustration this telephone has a concealed transmitter and receiver—to operate it is simply necessary to push the button and talk facing the vestibule telephone just as if in conversation with your party in front of you. The person talking from the suite can be heard for a long distance from the vestibule telephone, due to a specially constructed loud talking receiver. There is nothing on the face plate except the card holders and buttons. Therefore there are no cords or receivers to be stolen, no hooks to be broken.

There is no question that this outfit will revolutionize vestibule telephone sets. It is entirely new and novel—nothing of its kind has been heretofore placed upon the market. The perforated sound openings on the front of the plate are protected by a bug-proof brass screen.

Connecticut Vestibule Telephone.

The Connecticut Company is distributing its new bulletin No. 50, describing this material which will be sent on request.

Additions to Condulet Line

Condulets, Bulletin No. 1000 is the title of a 6x9 inch, 32-page supplement to Condulets, Catalog No. 1000, that has just been issued by the Crouse-Hinds Company. This bulletin illustrates, describes and lists many new types and styles of condulets and condulet accessories, besides numerous additional sizes of older forms of condulets. It is a book that should be exceedingly valuable to those who are at all interested in conduit installations.

Diamond Expansion Bolt Gets Decision

A decision dated July 24, 1915, has reached the Diamond Expansion Bolt Company from Judge Sanborn of the Federal Court, western district of Wisconsin, on its suit with the United States Expansion Bolt Company. The decision is very comprehensive and is summarized as follows by the Diamond Company:

a. The claim of the U. S. Expansion Bolt Company that Diamond bolts infringe the McCreery patent purchased after suit started in New York was dimissed, Diamond bolts being held not to infringe the McCreery patent.

b. Their claim of unfair competition against Diamond was also dismissed because the evidence did not support the claim.

c. Diamond's Cook patent was sustained valid, and not infringed.

d. Diamond's Pleister patent was sustained valid, and not infringed.

e. Diamond's case against the U. S. Company for unfair competition was sustained and an accounting and damages granted Diamond.

In short, both of our patents are sustained and valid, and while not infringed by their lag screw shields and anchors, they are found guilty of unfair competition, which will necessitate their discontinuing this unfair copying of our products and will stop the marketing of such copies by various dealers throughout the country in competition with our customers who have so loyally stood by us.

In commenting upon the position of the Diamond Company in the expansion bolt field Judge Sanborn stated:

The former (Diamond Company), while not covering the whole field, has done more than its share in introducing the expansion bolt to the trade, having spent large sums in advertising and demonstrating for some seventeen years.

In discussing the patent under which "Diamond N" shields and anchors are manufactured the court states:

At the same time Pleister made a practical advance in the art by producing a convenient bolt, adapted to modern needs, under which has been produced a form of device which is said to be the last word of combined style, cheapness and efficiency, and which complainant has adopted without variation, except in one particular. Under such circumstances the patent should be sustained as a refined but substantial advance in the art.

The clearing up of this case should tend to clear the atmosphere and operate to the benefit of the trade.

Diamond Concrete Inserts

The Diamond Expansion Bolt Company, New York, has recently placed upon the market two new forms of concrete inserts. They are designed to be set in concrete ceilings, walls or floors when the forms are in place. After the concrete has been run and forms removed they will provide a very secure adjustable attachment which may be used with four different diameters of machine bolts.

The Insert in Place.

The bolt is inserted as shown in the illustration with a bridging washer underneath the head or nut. It may be very quickly inserted and on withdrawing the bolt the bridging member is securely locked within the aperture and cannot be removed by accident. It can be removed only by reversing the operation of insertion.

It is claimed to have many advantages over types already in use. There is no enlarged portion to the slot where the bolt and bridging member are inserted so that equal security is obtained throughout the entire length of the slot. It has a liberal longitudinal adjustment as well as a slight lateral adjustment which is an advantage that will be readily appreciated by contractors using this form of attachment.

Setting the Insert.

By means of teeth on the inner side of the aperture the bolt will be firmly held in place when tightened or subjected to a load. It may be furnished with two sizes of bridging members, the larger to accommodate the head of a ⅝ inch or 9/16 inch machine bolt, the smaller size to accommodate either head or nut of a ½ inch or 7/16 inch machine bolt.

Tests made for the tensile strength of this insert have proved very satisfactory. The "Diamond N" type is of heavier construction and made in one piece of

The Larger Form of Insert.

malleable iron. The "Diamond X" is of a skeleton type construction and the cavity is enclosed by means of a pressed steel friction cover. Tests made on the "Diamond X" show that when a thin sloppy mixture of concrete is used there is no danger of water or slush entering the cavity.

Oshkosh Construction Tools

The Oshkosh Manufacturing Company has recently shipped quite large orders of outside electrical construction tools to Australian, South American and South African jobbers and a large order of anchors to the Post Office Department of Australia for use on government lines. The company is also holding a large order for shipment in the near future to Manila, P. I. It reports prospects for business in South America excellent and inquiries very plentiful and orders coming in much freer than previously.

Increasing export business has made it necessary that the company establish an export department in charge of E. H. Hoffman, who has had fifteen years' experience in the export field. Contrary to usual practice no price reductions have been necessary and in all cases regular prices plus packing and freight charges have been obtained and satisfactory credit arrangements made. It is stated that owing to the fact that in many instances tools have to be packed on mules, etc., the packing item is one to be watched with the utmost care in order to make the cases themselves of as small a weight and bulk as is consistent with the necessary strength.

The company has made arrangements with the H. B. Squires Company of San Francisco, Los Angeles and Portland, Ore., to handle its entire line of outside construction tools and specialties on the Pacific Coast. Mr. Squires has been for the past decade or more connected with another manufacturer of similar tools and is therefore thoroughly conversant with the line and this, with his long past association with Pacific Coast jobbers, makes him a valuable addition to the list of Oshkosh representatives.

The Oshkosh Company claims to pay ten dollars per thousand board feet more than the market for the fir that goes into its pike poles in order to secure special grade soft, old growth yellow Douglas fir, straight grained, free from defects and running fourteen to eighteen rings to the inch. In all its reels it uses rock elm instead of maple, although the latter is the cheaper. High grade crucible steel instead of common mild steel is used for all steel tool parts and for crow, digging and tamping bars, etc. The Electrical Operations Company, Brooklyn, N. Y.; the Union Electric Company, Pittsburgh, Pa., and the Pacific States Electric Co., San Francisco, carry complete stocks of these tools.

The Lineman's Third Hand

The lineman who puts up or repairs the wires on the telephone and electric light and power poles actually requires three hands to do his work efficiently—a hand for each wire and a third to do the tying or splicing. The Western Electric Buffalo grip does the work of a third hand. Its jaws may be clamped open at any width, the grip held in one hand and the wire inserted, no matter in what position the line may be. The patented locking device makes this possible while the rest of the construction is such that pulling only serves to strengthen the grip on the wire. The jaws of extra heavy drop forged steel will not injure the softest wire or insulation. The grip is made with and without pulley attached. It will hold all sizes of wire, bare and insulated, up to and including No. 0000 B. & S.

The fact that the Western Electric Buffalo Grip gives confidence and insures safety to the lineman and produces good joints, has made it the standard for more than eighteen years with many of the most progressive telephone and electric light and power companies.

The "Y & E" Record Safe

No building is in more danger from fire than that in which is located a telephone exchange. Every record which you have in your exchange is of vital importance to the success of your business. You couldn't get along without subscribers' records, contracts or correspondence, yet how much thought have you given to placing these records where they will be protected from fire? One fire and out go your records.

It is advisable to consider that chance and look into the value of such a protection as the "Y and E" record safe. This safe has been designed by a prominent safe manufacturer and is built of heavy rerolled steel on a welded angle frame. The combination of 2-inch air space between the inner and outer shells, plus the heat resisting quality of oak filing cabinets which form the interior, make a decidedly superior fire proofed equipment.

It is not always the flames which consume the records, but sufficient heat will do the trick. The safe will place your mind at ease as regards the safety of your records.

The Yawman & Erbe Manufacturing Company will be pleased to furnish any additional amount of information on this record safe if you request copy of its folder No. 2504.

Kellogg Equipment for Hotels

One of the finest Texas hotels, the Riggins, at Waco, has complete Kellogg telephone equipment in each of the 225 rooms. This is the only hotel in the state furnishing its guests rooms with desk type telephones. The bell boxes are finished to match the mahogany woodwork.

The time has gone by when antiquated annunciator systems even in smaller hotels, will satisfy the demands of the traveling public. The best telephone equipment is a real asset, because it offers to every guest the greatest convenience of modern times.

The Leeds and Northrup Company, Philadelphia, is sending out literature of great interest to users of measuring instruments. Among circulars received recently are "N. B. S. Resistance Standards," "New Type Portable D'Arsonval Galvanometer," "Resistance Boxes and Wheatstone Bridges," and an odd stock list of instruments at bargain prices.

A circular describing the Peerless switch dial decade testing set (Type CS-2011) made by the Thompson-Levering Company, Philadelphia, is very interesting reading and should prove valuable to telephone men.

E. E. Clement, the widely known patent and telephone expert of Washington, D. C., is describing to his friends an extremely interesting electric light clock sign, an advertising novelty that is really novel.

The Argentina government will extend a telephone line from Viedma to the city and district of Carmen de Patagones.

Brevities of the Business

The Activities of the Whole Telephone Field Told in Short Paragraphs

PERSONAL NOTES.

M. Umbach, traffic manager of the Home Telephone Company, Ft. Wayne, Ind., has been elected president of the recently organized Northeastern Indiana Telephone Association. Mr. Umbach entered the service of the Home Telephone Company in 1906. Shortly afterwards he was advanced to position of manager of the long-distance department, which position he now holds under the title of traffic manager. He is also in charge of the toll and rental business of the company's exchanges at Kendallville, Auburn and New Haven. Mr. Umbach was one of the first to advocate the "get-to-gether" movement among operators. *Toll Line Flashes*, the Home company's house organ, was his first step in promoting a means whereby personal talks could be exchanged monthly with operators. And indeed this little paper has become a much welcomed visitor in every exchange. Due to his constant effort, the new organization was formed, and in recognition of his labors he was chosen as its president. It is expected that with Mr. Umbach as its president, the new organization will thrive and develop many benefits for its members.

A. H. Krom, 828 East 42nd street, Chicago, formerly electrical engineer in the Department of Gas and Electricity, has been appointed assistant telephone engineer on the staff of the State Public Utilities Commission of Illinois. Mr. Krom is a graduate of the electrical engineering department of Purdue University, with the degree of bachelor of science, and has been active in Chicago engineering circles since his graduation in 1910. His most recent work of particular note has been in connection with the organization of the American Association of Engineers, recently formed in Chicago, which has a national scope, devoted to the improvement of conditions in the engineering field. Mr. Krom is chairman of the Membership Committee, and the by-weekly membership boost meetings, which he has been conducting at the Boston Oyster House Subway during the past six months will be continued by the other members of his committee. The association is particularly fortunate in having such an active member recognized by the State Public Utility Commission and anticipates that Mr. Krom will duplicate his fine record with the city, in his larger field of endeavor.

E. A. Hawkins, telephone sales manager, and J. F. Sweeney, telephone sales engineer of the Western Electric Company, were callers at the offices of TELEPHONE ENGINEER recently.

Dr. J. H. Close, assistant secretary of the Kansas Public Utilities Commission, has resigned his position to become secretary of the Independent Telephone Association September 1. Dr. Close will have headquarters in Topeka and succeeds Fred Coulson, who has been transferred to Abilene as commercial superintendent of a score of Independent exchanges in Saline, Dickinson and Mitchell counties. Malcolm Gray, a prominent lawyer of Leavenworth, succeeds Mr. Close.

H. E. Band has been appointed traffic supervisor for the Chicago Telephone Company in the St. Charles, Illinois, territory.

C. J. Queen has been made general manager of the Akron district, comprising territory formerly occupied by the Akron People's Telephone Company, succeeding W. F. Laubach, resigned. Mr. Queen assumes his duties August 15.

At a meeting of the board of directors of the Consolidated Telephone Company, held July 28, at Hazelton, Pa., William B. Given, presented his resignation as president due to ill-health, and H. W. Daron, resigned as secretary. The board elected Alvan Markle, president, H. C. Trexler, chairman board of directors; Henry A. Bishop, vice-president, and C. J. Kirschner, secretary and treasurer.

Walter Dixon, who for the past two years has been manager of the Dundee exchange in Illinois for the Interstate Telephone Company, has been made manager at Aurora, and is succeeded by M. S. Stout.

Miss Grace Keller has just completed thirty years' continuous service at the telephone board of the Lititz exchange for the Bell Telephone Company of Reading, Pa.

C. V. Mendenhall has tendered his resignation as manager of the Buffton exchange for the United Telephone Company of Indiana.

C. E. Tarte, general manager of the Citizens' Telephone Company, Grand Rapids, Michigan, has returned from a trip of inspection of offices at Allegan and Lansing.

J. F. Buckles, who has served as lineman for the Christian Telephone Company, Illinois, for a number of years has resigned his position at Edinburg, for a like charge at Morrisonville. E. A. Stadley of Moweaqua will assume his duties as successor.

Frederick W. Kessler, for the past eight years manager of the Valley Home Telephone Company at Bay City, Michigan, has been promoted to general commercial agent. Mr. Kessler is succeeded by John S. McIntosh.

R. G. Gomez, telephone expert of the state public utilities commission, has left Denver, Colorado, on an inspection trip through the state to check up on the appraisal work which is being done by employes of the Mountain States Telephone & Telegraph Company.

NEWS FROM THE FIELD.

ARKANSAS.

The new exchange at Oak Station on Pulaski Heights, has been put in operation by the Southwestern Telegraph and Telephone Company.

The telephone exchange in the Comak building in Portland was destroyed by fire August 3.

The Southwestern Telephone and Telegraph Company has installed a new exchange at McNeil.

WASHINGTON, D. C.

Samuel P. Fisher has been appointed by Judge T. B. T. Thornton receiver for the Capital City Telephone Company which operates a telephone system in this city and surrounding territory.

FLORIDA.

R. L. Boyd, district manager of the Bell Telephone Company, has announced that his company is about to spend the sum of $40,000 in the acquisition and improvement of the telephone system at Sanford, and to this end it has purchased outright the plant of the old Sanford Telephone Company with its 500 subscribers. The engineers of the Bell Telephone Company from Savannah are now making plans for a complete rejuvenation of the system and the plant will have an increased capacity of about 1,500 subscribers. J. F. Karnatz will be the local manager at Sanford but this office will be under the direct supervision of Mr. Boyd.

Many improvements are to be made in the system of the Tallahassee Telephone Company at Tallahassee.

ILLINOIS.

The Western Illinois Telephone Company is making extensive improvements on its exchange at Bushnell. The company has purchased several thousand feet of cable, set hundreds of new poles throughout the city and will remove all the present open wire leads. A new common battery switchboard has already been installed and as soon as the outside work is completed the Bushnell exchange will be in first class condition.

The Oneida Mutual Telephone Company, Oneida, recently purchased a building and moved the switchboard into it. The company also has put up new cable and poles and put the exchange in splendid condition.

George Glass, general manager of the Citizens' Telephone Company of Pekin, is considering a contract for the erection of

a telephone building at South Pekin. The building is to be a substantial two-story structure, whose exterior will be of cement. This building will accommodate eight or ten operators.

Noble Mutual Telephone Company, Noble; capital, $2,500; incorporators, H. F. Diel, Webster Hanna, R. S. Hanna.

E. S. Sterrett, vice-president and general manager of the Abingdon Home Telephone Company, is making preparations to install a new plant in Clinton.

Contracts have been let by the Morrison Telephone Company for the installation of all cable work in Morrison. Part of the cable will go underground and part on poles. Besides this work the company will also let a separate contract for a switchboard and telephones.

Southwestern Bell Telephone Company of Illinois, East St. Louis; capital, $2,500; incorporators, H. J. Pettengill, E. D. Nims, J. P. Crowley.

The Chicago Telephone Company declared the regular quarterly dividend of $2 per share on the stock, payable September 30 to stock of record September 29.

The annual meeting of the Central Telephone and Telegraph Company of Paxton was held August 12. The following were elected to serve as directors: H. B. Henderson, C. A. Nordgren, C. H. Swanson, Chas. Wesslund, G. J. Johnson, Clyde Thompson and D. C. Swanson. The directors elected the following officers: President, G. J. Johnson; vice-president, D. C. Swanson; secretary and treasurer, H. B. Henderson; attorney, F. M. Thompson.

The Rock River Telephone Company has bought a new switchboard for the Oregon exchange.

INDIANA.

All telephone wires in the fire district of South Bend are being placed under ground, at a cost of over $50,000.

The People's Telephone Association of Indiana, operating in Lawrenceburg, Aurora and adjacent territory, has sold its lines and franchise to the Southern Indiana Telephone Association.

Work on remodeling and repairing the Evansville offices of the Southern Telephone Company at Indiana, and the erection of a three-story addition will begin in a short time. About $25,000 will be spent on the improvements.

Boone Township Telephone Company, Summitville, has increased its stock to $1,000.

The owners of the Seymour Mutual Telephone Company at Seymour have purchased and taken over the Home Telephone Company, of Brownstown, which operates exchanges at Brownstown, Vallonia, Crothersville, Cortland and Freetown. This gives the Seymour Company control of nearly all the lines in Jackson county. L. C. Griffitts heads the company and is in charge of the business.

Manager A. R. Otis of the Bell Telephone Company has announced that many new improvements will be made in the local exchange at Rome City. The exchange is to be moved into new and commodious quarters, directly across the street from where it is now located and the rooms are being overhauled and put in condition. New cables to be laid and a new switchboard installed.

IOWA.

Plans are being perfected regarding the installation of the new telephone switchboard at the city hall in Davenport.

The Western Electric Telephone Company has begun the laying of conduits for underground cable in Estherville, which is a part of the new $65,000 telephone exchange to be installed.

A $3,300 addition to the switchboard, which will accommodate three hundred additional subscribers, has just been made by the Iowa Telephone Company at Ames.

Workmen have started on the improvements to be made in the Fort Madison exchange of the Iowa Telephone Company.

KANSAS.

The telephone system at Larned will be rebuilt.

Minor H. Day, formerly wire chief with the Leavenworth Telephone Company, has taken over the Lansing exchange and assumed control of the stock of that company. The Lansing exchange extends out into Delaware township and has 5,000 subscribers.

The Ford Mutual Telephone Company has purchased a new switchboard from the Kellogg Company.

The Bell Telephone Company of Witicha has begun the installation of a new telephone system at Kingman.

Stock is being subscribed to build a telephone line between New Ulysses and Satanta.

KENTUCKY.

The Maysville Telephone Company has been granted a twenty-year franchise by the council at its last meeting. The company will spend $40,000 in rebuilding its lines.

MICHIGAN.

Work on the new exchange building of the United Home Telephone Company on Terrace street, near Clay avenue, Muskegon, is going forward rapidly. The new exchange building will be one of the finest of its kind in this part of the state and will be completed about September 1. The structure measures 40x70 feet and the cost of construction will be almost $20,000.

Stockholders of the Citizens Telephone Company of Jackson at their annual meeting a short time ago elected directors as follows: J. C. Richardson, E. W. Barber, W. H. Maloney, Z. C. Eldred and T. G. Barkworth of Jackson, and R. D. Graham, C. E. Perkins, John B. Martin, W. J. Clark, P. B. Garvey and C. E. Tarte of Grand Rapids.

The annual meeting of the Citizens Telephone Company will be held September 14 at the company's offices in Grand Rapids.

Kibble Telephone Company, Kibbie; name changed to Van Buren County Telephone Company.

MINNESOTA.

The Forest Telephone Company, which is building telephone lines into the farming district along the Miller Trunk road for about fourteen miles, is making rapid progress. The line runs into the Morrison road six miles after leaving the Miller trunk.

The Warba Telephone Company has been organized with the following officers: W. P. Hicken, president; Mathew Rosholt, vice-president; Charles Butterfield, secretary; R. W. Hawkins, treasurer; directors, W. P. Hicken, Mathew Rosholt, C. A. Martin, William McCaffrey, A. J. Mostoller.

A three-story brick and concrete telephone exchange building is to be erected at Third avenue and Sixth street south, Minneapolis, by the Tri-State Telephone and Telegraph Company, according to the building permit which was recently issued by J. G. Houghton, building inspector. The structure is to have a frontage of 120 feet on Third avenue and extend back 66 feet. It will cost $80,000, and will be ready to handle a portion of the downtown business on February 1, 1916.

The railroad and warehouse commission of Minnesota recently authorized the first consolidation of telephone companies under the 1915 law. Permission was granted the Fulda Telephone Company to buy the Brewster-Brown Lake Telephone Company for $20,000. There was no objection to the consolidation.

MONTANA.

Farmers between Shonkin and Minar are erecting a telephone line.

NEW MEXICO.

The new telephone system, which workmen have been installing in Silver City for the past month went into effect August 15.

NEW JERSEY.

The board of directors of the Hackettstown Telephone and Telegraph Company have perfected negotiations for the purchase of the local plant of the Delaware and Atlantic Telephone Company and to consolidate the two companies to give the patrons of the local company long distance service.

NEW YORK.

New York Switch & Panel Board Company, Inc., Manhattan. Manufacturing and deal in switchboards, etc.; capital, $25,000. Incorporators: J. W. Smith, F. Weierman, 52 Vanderbilt avenue, New York City; J. F. P. Young, Maspeth.

Capital increases: New England Telephone and Telegraph Co., New York, $50,000,000 to $75,000,000.

NORTH DAKOTA.

A movement has been started at Charlson and vicinity for the construction of a telephone line to Schafer or Watford.

Amidon's telephone exchange is now in operation.

The stockholders of the Queen City Telephone Company of Ryder held a meeting and voted to bond the company in the sum of $7,200, to pay its outstanding indebtedness. The bonds are all to mature by the year 1922 and will bear interest at the rate of 6 per cent per annum.

OHIO.

The Conneaut Telephone Company, Conneaut, increased $100,000 to $175,000.

Roachdale Union Telephone Company of Roachdale has dissolved.

OKLAHOMA.

A new telephone line, supplanting the old one now in use, is being erected between Cordell and Hobart by the Cordell Telephone Company.

Eureka Rural Telephone Company, Collinsville; capital stock $550. Incorporators: George Esau, W. F. Just, H. L. Loewen, all of Collinsville.

OREGON.

A permit to do business has been issued to the Salem-Kaiser Telephone Company at Salem. C. F. Hagemann is president, and Fred C. McCall is secretary, and the capitalization is $1,400.

PENNSYLVANIA.

The report for the six months ending June 30, 1915, of the Pacific Telephone and Telegraph Company shows gross earnings of $5,026,500 in 1915, against $4,766,791 in 1914; net earnings decreased by $32,067 from $1,159,932 in 1914 to $1,127,865 for the same period in 1915. The surplus shows a decrease from $111,405 in 1914 to $32,525 this year.

Mutual Telephone Company, Erie, stock $500,000 to $1,000,000.

SOUTH CAROLINA.

The secretary of state has issued a commission to the St. John's Telephone Company of Monck's Corner with a capital of $1,000. The petitioners are J. R. Williams and W. K. Fishburne.

SOUTH DAKOTA.

The Salem Telephone Company, capital stock $3,500, incorporators, Fred Blankartz, Henry Kolback, John A. Wener and William Westhoff.

TENNESSEE.

The Cumberland Telephone Company is nearing the finish of three main trunk lines at Athens to replace the many wires heretofore used.

A farmers' telephone line has been established by Manager Cruze of the Cumberland Telephone Company from Tiptonville to Phillippy.

Christiana Telephone Company, Christiana, Rutherford county, Tenn.; capital stock, $1,000. Incorporators: H. H. Clark, A. N. Miller, N. D. Ellis, W. T. Gentry, G. W. Smotherman. For building telephone lines and doing general telephone business.

The American Telephone and Telegraph Company has a large force of workmen stationed at Lynnville repairing and making additions in their lines located at Waco and in this section along the Pulaski and Columbia pike.

TEXAS.

At the regular meeting of the city council held August 13 a proposition to merge the two telephone exchanges in Waxahachie was rejected.

The Afton Telephone Company, Afton, Dickens county, capital stock $1,650. Incorporators: B. F. Yeates, W. R. Stafford, R. M. Hamby.

Damages of from $75,000 to $100,000 were sustained by the Southwestern Telegraph and Telephone Company at Houston as a result of the hurricane, according to T. S. Prentice, manager.

UTAH.

General Manager DeNike of the Mountain States Telephone and Telegraph Company, announces completion of traffic arrangements with the Altonah Telephone Company for a new line extending from Kamas to Duchesne.

VIRGINIA.

Oak Ridge Telephone Company, Oak Ridge, Va. Maximum, $5,000; minimum, $2,000; par value, $100. Build and operate a telephone line. C. H. Yates, president; R. B. Carruthers, secretary and treasurer; both of Oak Ridge.

WASHINGTON.

A. B. Campbell, proprietor of the Marcus Telephone exchange at Marcus recently sold out to H. P. Thayer of Denver, Colorado, who has assumed charge and is now improving and extending the system.

WEST VIRGINIA.

The Odd Telephone Company at a recent meeting of the stockholders decided to extend their line from Odd by way of Abney and Pemberton into Beckley.

A vigorous fight is being waged in the northern half of West Virginia to have the two telephone companies, which are operated in Grafton, consolidated. A joint meeting of representatives of the boards of trade in Grafton, Wheeling, Parkersburg, Clarksburg, Weston, Fairmont, Elkins, Shinnston, Morgantown and Mannington will be held at Fairmont the first week in June.

WISCONSIN.

At the annual meeting of the stockholders of the Wautoma-Mount Morris Telephone Company, held at Wautoma recently, the following officers were elected: President, E. F. Kileen; vice-president, O. B. Olson; secretary-treasurer, L. H. Larsen. The company paid a 10 per cent dividend the last year.

Thorp Telephone Company, Thorp; capital, $25,000; incorporators: M. Lund, L. A. Lund, C. A. Lund, V. M. Lund.

The capital stock of the Barron County Telephone Company has been increased from $50,000 to $100,000. A new switchboard will be installed.

The Rhinelander Telephone Company is building a line four and one-half miles long from Starks to Gagen.

Articles of incorporation have been filed for the Sanborn Telephone Company of Sanborn, with a capital of $4,000. E. M. Bartlett, Theodore Werder, and Nels Swanson are the incorporators.

By an order of the railroad commission, the Grand River Telephone Company is directed to improve its service and farmers' lines connections in Columbia county.

The Stanberry Rural Telephone Company, Stanbury; capital $1,000. Incorporators: Walter A. Mack, A. E. Briggs, R. A. Jarvis, William M. Elliott and D. C. Wade.

Frederic Rural Telephone Company, Frederic; capital $14,000. Incorporators: R. G. Arverson, Morris E. Yager, C. A. Carlson, Louis A. Copeland, Frank R. Hatfield, I. C. Olson and A. W. Slomgren.

The Wisconsin Telephone Company has started work on enlarging their telephone exchange at Eau Claire. An approved estimate amounting to $1,800 covering the installation of an additional toll position and the extension of the local switchboard facilities has been received by J. E. Bonnell, the local manager.

The telephone exchange at Eagle River has been moved from the Colman building on Wall street into their new building on First street.

Announcement has been made by the Lovell Telephone Company of the Montana purchase of the properties of the States Telephone Company, consisting of the line extending from Lovell to Garland by way of Byron and Penrose.

A new switchboard has been installed in the telephone exchange at Marshfield.

Knowlton Telephone Company, Knowlton. Capital, $3,000. Incorporators: J. H. Cater, E. L. Cater and Ada Feit.

Plans are under way by the Wisconsin Telephone Company for the erection of a new building at Superior. The building will be located at 1417 John avenue between Fourteenth and Belknap streets; will be a modern three-story structure, costing in the neighborhood of $150,000.

The laying of the cable from Madeline Island to Bayfield has been completed, enabling the residents of Madeline Island to keep in telephonic touch with the outside world.

A rural telephone line has been organized southwest of Merrill known as the Snow Hill Telephone Company. The officers of the company are: President, Louis Kleinschmidt; secretary, William Yaeger; treasurer, Will Sukow.

The Friendship Telephone Company is now located in their new headquarters in Adams, having moved their exchange from Friendship.

Doering Telephone Company, Doering; capital, $5,000; incorporators: P. H. Krueger, Joseph Parent, Robert Miller.

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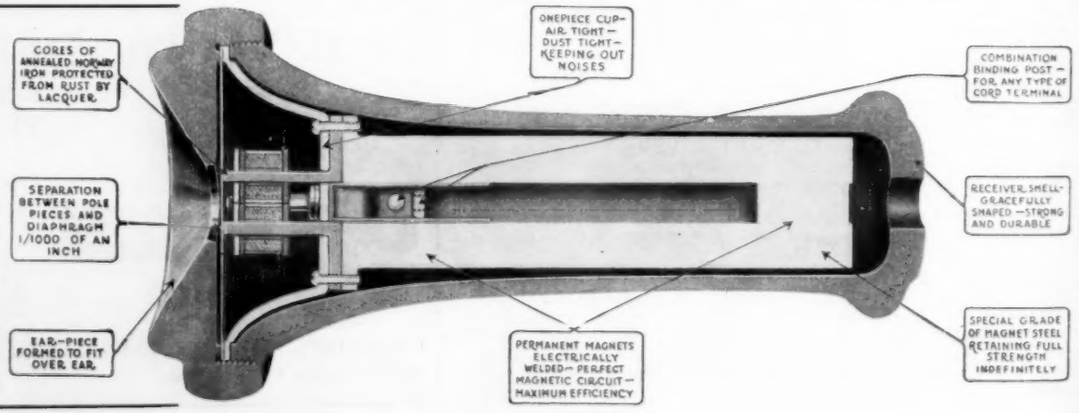
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